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LECTURE II.[1]

IN the preceding lecture we reviewed some of the objective aspects of effort. Before proceeding to study the other bodily concomitants of cerebral activity, I wish to summarise what objective study has taught us of the state of activity that we designate as effort. In the first place, all the phenomena recorded were in the nature of increased bodily activity and not of the inhibition of activity, that it might be thought would permit the more readily the uninterrupted response of the specific mechanism to the stimulus. We found that the generalised bodily reaction of effort bore a direct relation to the difficulty—that is, to the chance of failure of the specific mechanism in performing its appropriate action and we noted that when this bodily response experienced any diminution, the accuracy of the specific performance was likewise diminished. Lastly, we found that the net result of such of the bodily changes observed in effort was to increase the general efficiency of the body, whether by accelerating and increasing the simpler motor reflexes or by influencing the blood-supply of the nervous system by an increase of the intrathoracic pressure and vasomotor changes.

Now let us interrogate our consciousness as to the feeling that we experience during effort. As in the case of other affective states that we shall study later, we find that to attend to a feeling is, to a great extent, to lose it. We are aware of certain respiratory sensations, a certain sense of increased cardiac action, of intracranial pressure, and of postural tension. Sometimes one, sometimes another of the constituents of this feeling of effort becomes so dominant that the vague feeling is swamped by a distinct sensation such as I instanced in the case of the respiratory symptoms experienced in performing a count of the particles ingested by phagocytes. The general sum-total of the sensory presentation of the bodily changes of effort is a disagreeable one. The sooner that we can cease from effort and find our specific task performed the better pleased we are.

Ribot has emphasised the fact that nobody really has pleasure in work itself, it is to its accomplishment that we really look forward with pleasure. Now whether we regard effort from a purely mechanical point of view, or whether we take cognisance of its affective aspect, the conclusions that will be drawn are much the same. A stimulus is presented, the specific response to which is inadequate, or else the task would be accomplished with mathematical certainty. When such a stimulus fails to arouse an adequate response on account of its own feeble nature, nothing further happens except that the response will itself be a feeble one. When, however, the stimulus is powerful and insistent and the mechanism of response is inadequate another and more diffuse constellation of reflexes is aroused. Various bodily activities are brought into action, all of which tend to increase the efficiency of the specific mechanism. The sensory presentation of these bodily activities is a disagreeable feeling which we do our best to allay by accomplishing the specific action demanded. Viewed from this angle we shall see that the mechanism of effort resembles that of the affective states that we are about to consider, and further, that no distinction can be drawn between effort and the conception of attention as propounded by Locke and in a less incisive fashion by Hamilton. It will be obvious that when through either innate or acquired disability the specific mechanisms are everywhere inadequate to respond to the tasks that they are called upon to perform, the never-ceasing activity of the mechanism of effort will prove exhausting to the body, and in its sensory aspects a most distressing form of neurotic disturbance.

REACTION MANIFESTED BY CHANGE IN ELECTRICAL PROPERTIES OF THE SKIN.

Hitherto the reactions that we have studied have been occasioned by the activity of striated or non-striated muscular tissue. I now propose to deal with a reaction that is manifested by change in the electrical properties of the skin. This reaction was first described by Féré in 1888 as an emotional response, manifesting itself by a diminution of the resistance of the body to the passage of an electric current. Galvanometric deflections occurring when the skin was explored by a pair of electrodes were independently described by Tarchanow in 1890, and found by him to occur as responses to physical and psychical stimulation. He considered them to be due to secretory currents of the skin glands.

The investigations of both of these observers were to a great extent ignored, and the same fate befell Stricker's confirmation of Tarchanow's experiments in 1902. It was not till 1904 that the subject was reinvestigated, when Veraguth, stimulated by some preliminary observations on bodily resistance by E. K. Müller, confirmed the observations of Féré and gave the first systematic exposition of what he termed the "physico-psycho-galvanic reflex." He described this reflex as a diminution of the resistance of the skin to the passage of a constant current occurring as a response to stimuli which caused an alteration of the affective state. It is not possible in the course of these lectures to deal with the mass of observations that have since accumulated from the work of the many experimenters who, subsequently to Féré and Veraguth, have investigated this phenomenon. Nor are we concerned for the moment with the physical nature of the response. It is sufficient to state that the galvanometric effect is beyond all doubt due to a diminution of the electrical resistance offered to the passage of a constant current by the skin, and that this diminution is exhibited as a maximum effect in the palms of the hands, a little less obviously in the sole of the foot, and scarcely at all in other parts of the skin. This statement, which is founded on the careful exploration of all parts of the body surface by Gildermeister, has been confirmed by every observer who has worked on the subject.

The work of Crile and his pupils has shown that an increase of electrical conductivity, or conversely a diminution of resistance, is associated in all tissues, with an increase of their metabolic activity; we may tentatively regard the galvanic response as a sign of the increased activity of the gland-bearing area of the skin. If it be to the activity of the cutaneous glands themselves that we must ascribe the galvanic reflex it is certainly not due to the gross manifestations of that activity by the excretion of sweat. In 1918 I had a neurotic patient who suffered from hyperidrosis of both hands, the sweat falling off from the tips of the fingers in drops. I found that this patient exhibited the galvanic response to all adequate stimuli in a marked degree, although the palms were covered by a thin layer of sweat, and it was unthinkable that any actual increase in the amount of fluid excreted should have an influence on the conductivity of the sodden skin. I showed the case to Prof. Waller, and he also remarked on the magnitude of the galvanic response given by this patient. It is further obvious that the galvanic response, if it be associated with glandular activity, can only be governed by the centrifugal nerve impulses that travel through the fibres of the sympathetic, and we shall later see reason to believe that, in common

[1] Lecture I. appeared in THE LANCET of July 16th. Lectures III. and IV. will follow.

with all the other mechanisms which take part in the general bodily reaction to nocuous stimuli, the galvanic reaction is conditioned by the response of the thalamic system. That changes in the peripheral blood-supply have nothing to do with the response was shown by the experiment of Veraguth, who obtained normal responses from a limb exsanguinated by an Esmarch bandage.

I now propose to deal with some of the aspects of the galvanic reflex that will prove of service in the objective study of the bodily response to cerebral activity. Before doing so, I will indicate briefly the technique that can be usefully employed for this purpose. In my own experiments I have been in the habit of measuring the bodily resistance to a current of a couple of Leclanché cells which is passed through the body from two liquid electrodes of normal saline into which zinc terminals dip. The subject is seated with the hands immersed one in either electrode, and forms the fourth arm of the familiar Wheatstone bridge circuit. I prefer the liquid electrodes to the solid zinc electrodes strapped on to the back and front of a single hand, because slight shifting of the electrodes due to movements occurs rather easily when the latter procedure is adopted; further, the low resistance measured allows its easy demonstration to the uninitiated without having to multiply up the results by using unequal ratio arms in the resistance box. The point is, of course, of no importance. For experimental work I have abandoned the moving coil galvanometer for the Einthoven instrument, since with this type of galvanometer it is alone possible to measure time relations with any degree of accuracy, and an additional interest is given to the records by the appearance of the heart beats in the curves. Further, with the double-string instrument which I owe to the generosity of Mr. Alfred Teniers it is possible to obtain either simultaneous records of the galvanic response of two parts of the body or of muscular or respiratory variations accompanying the galvanic reflex.

Nature of Stimulus Evoking Galvanic Response.

The first subject for inquiry is as to the nature of the stimulus that evokes the galvanic response. Practically all those who have concerned themselves with this reflex agree that stimuli adequate for the galvanic reflex are capable of causing an affective state. We are in no way entitled to draw the inference that the occurrence of an affective state is necessary to the exhibition of the reflex, and still less that the occurrence of the reflex conditions an affective state. While the examination of the relation between bodily activity and states of feeling may be reserved at this stage for later discussion, it must here be pointed out that an affective state, to exist at all, must be experienced by the subject. Now, a galvanic response may occur without the subjective experience of an affective state. I have frequently observed a response to be elicited by a stimulus when the subject affirms that the stimulus has for him no feeling tone. This may be best observed in the performance of word association experiments. The response to a certain word may be marked and yet when the subject is interrogated he is at first unable to discover any association of emotional significance in the word, and, moreover, he assures me that the word left him absolutely indifferent. It is true that further examination generally succeeds in recalling a hidden emotional significance, and thus reveals that the stimulus activated a specific reflex system that at one time had a nexus with the mechanism of feeling; but that is not the point. If we accept the assurance of the subject, we must believe that the reflex occurred without his experiencing any feeling connected with the word. To talk of a subconscious feeling is, of course, to talk nonsense. The same point may be verified by purely introspective investigation. When a painful or presumably painful stimulus is applied to the hand, such as touching it for a moment with a flaming match, a well-marked reaction will be obtained.

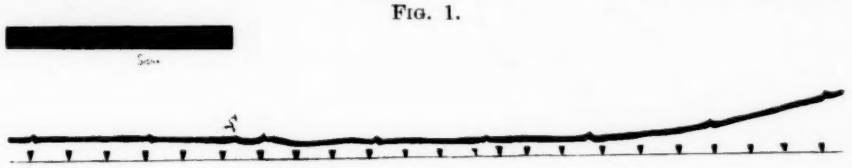
If, however, the experiment be repeated a number of times in succession without the injury inflicted corresponding to that which was anticipated at the first stimulation, the subject becomes indifferent and possibly bored with the performance, and yet with each application of the stimulus there is still a galvanic reaction though the subject is well assured that he feels no apprehension. To appreciate the cogency of the experiment one must oneself serve as a subject, and there is no mistaking the genuine surprise with which one observes a reaction to a stimulus that has become a matter of indifference. I shall refer to this experiment again when we come to discuss conditioned reflexes. Here its importance lies in the fact that the reaction takes place in the absence of an affective state. Many observers have maintained that the galvanic reflex accompanies mental effort as well as states of feeling. We have just now discussed the sensory concomitants of effort and I hope to have succeeded in demonstrating that they constitute what we know as an affective state; but I do not consider that they are normally accompanied by a galvanic reaction. When, however, an intense effort results in one or other of its sensory factors assuming overwhelming proportions, we have said that it is presented as a distinct disagreeable sensation and may as such arouse the same system of reflexes as it would were it a sensation caused by a specific stimulus. In this connexion I instanced the feeling of suffocation during a cell count. In the performance of word association tests I have generally found that the first three or four word reactions in the examination of a a new and nervous subject are accompanied by a galvanometric deflection, even though they be essentially neutral words. This is simply an expression of the state of anxiety on the part of the subject, who soon settles down and responds electrically only to words having an emotional significance.

Partial Clearing up of Confusion Between Subjective and Objective Standards.

These considerations indicate some of the difficulties to be encountered in any attempt to elucidate the meaning of a physical response by an appeal to subjective evidence; a similar confusion of subjective with objective standards has proved to be such a stumbling-block in the physiology of the afferent nervous system. In that case the problem for the physiologist is not what is the presentation to consciousness following on the stimulation of an afferent nerve-ending, but what are the reflexes that such stimulation evokes, and by what form of stimulus is the receptor organ excited. Thanks to the introduction of the idea of the existence of a system for the transmission of nocuous stimuli by Sherrington, and its correlation with the thalamic reflex system by Head and Holmes, the physiology of the nociceptoral nervous system has been made relatively clear, and we have eliminated many of the obscurities that were so perplexing when the subjective sensations of the patient were our only guide. Likewise, in considering the galvanic reflex the first question to be considered is what are the objective characteristics of the stimuli that evoke this increase of conductivity on the part of the skin—an increase which we have reason to consider to be an index of a general increase of functional activity and to be correlated to certain states of feeling. The answer is that in the first place any type of stimulus that tends to cause damage to the body, or that threatens such a change in the environment as is likely to result in bodily damage, will prove to be an adequate stimulus. In the second place we must recognise not only actual bodily damage but the disturbance of the smooth working of bodily activities as the characteristic of another class of stimuli which will evoke the generalised bodily reaction of which the galvanic reflex is a sign. The first class of these stimuli is represented by such physical disturbances as may result from a blow, a burn, a prick or pinch; or those acting from a distance, such as loud sounds, blinding lights, or noxious smells; or, again, endogenous stimuli, such as colic or neuralgia.

Fig. 1 shows a typical reaction as registered by the string galvanometer to a prick, the initial muscular start of which we shall have more to say is clearly seen. If now we proceed to use verbal stimuli instead of actual physical procedures we are using a type of stimulus belonging to the second category of our classification. The simplest form of verbal stimulus will be the threat of the application of a nocuous physical stimulus. Fig. 2 shows the responses to the threat of a prick and to an actual prick. Here we might hope to obtain some light on the relations of the two nervous mechanisms aroused. In this particular case you will note that the response is as great to the threat as it is to the act. I should like to be able to say that it was possible to correlate the mentality of my subjects with the relative efficiency of the two stimuli, but the results obtained from a large number of observations have been too inconstant. There are probably too many factors involved in the experiment—the degree of dramatic conviction with which the threat is performed, the attention of the patient, and the relative severity of the actual physical stimulus, must all be variables.

FIG. 1.



Galvanic response to a prick. Observe start (S) at the moment of stimulation. The heart beats are clearly shown. Time interval one-fifth of a second.

The threat to cause bodily discomfort is the simplest form of verbal stimulus. From this point onwards the stimuli may be elaborated by the representation of circumstances either past or present that are opposed to the well-being of the subject or are in conflict with the general tendency of his conduct—that is, stimuli such as will on the affective side evoke the feelings of grief or anger. So much for the galvanic response to external stimuli, but even more important is the galvanic response to stimuli whose immediate origin is in the autogenous neural processes of the subject. The spontaneous representation of some disagreeable or painful circumstance will serve equally well to elicit the galvanic reflex. Whether the subject recalls silently some past experience of a painful nature or whether he communicates it verbally to the observer the representation will in both cases evoke a diminution of skin resistance. We can now determine objectively the nature of the stimuli that will evoke the reflex without any further appeal to the evidence furnished by subjective inquiry. We note that one and all the stimuli have this property in common—their continuance is inimical to the well-being of the subject. Obvious as this is for the physical stimuli, it is no less clear when we consider the stimuli derived from outside verbal suggestion or from the representations evolved by the subject's own activities. The representation of an old pain must, if it be sufficiently vivid, involve all those reactions that occurred with the original stimulus. In so far as it falls short of representing them it falls short of being a vivid impression. I need hardly remind you that a representation must call into activity those nervous mechanisms that were aroused in the first instance, and that their necessary modification by subsequent neural associations constitutes the difference between the actual and the revived experience. In so far as the bodily response is concerned, the stimulus will in both cases be of the same nature as the initial physical stimulus, and from the objective point of view the reflex increase of conductivity evidences the same type of nervous activity. Fortunately for ourselves the representation can never or very seldom occur in anything approaching its first intensity. In many instances it cannot recur at all in a normally constituted organism.

FIG. 2.

Galvanic response to burn and threat of burn. Graduations of diminution of resistance by 200 ohms.

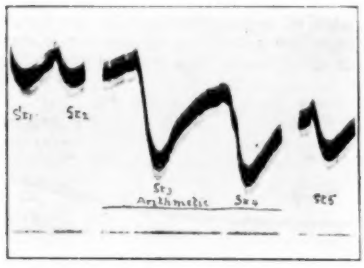
THE GALVANIC REFLEX NOT UNDER VOLUNTARY CONTROL.

The completeness of representation is the test of the degree in which the activities of the organism as a whole have been modified by the original experience. I try to recall an old toothache and I succeed in recalling concomitant experiences, but not a twinge of the original toothache. I recall a profound grief, and I shall feel much of my pristine pain and sorrow. Now the galvanic reflex distinguishes between these two types of representation, and this is what makes it so valuable for the objective study of cerebral activity; in our inner lives we are not always quite sure ourselves as to whether we have really any feeling about a subject—that is, whether it evokes a bodily resonance or whether it is merely a subject about which we think that we ought to feel strongly, whereas, in fact, it fails to arouse any bodily response. It is the objective demonstration of these two states that is furnished by the galvanometer. Anyone who cares to sit quietly by himself and recall past experiences whilst connected with the galvanometer circuit will learn much about matters that he has hitherto taken for granted. The resistance reaction is not under voluntary control; it is impossible to evoke it by simulation of affective states, such as a fictitious rage, nor can the mere recitation of emotional poetry, no matter with what emphasis it be declaimed, produce a reaction unless by some chance a phrase acts as a stimulus to evoke some association with a personal experience of affective import.

I will now pass on to consider some of the other aspects of this reflex that are of importance in affording information as to the relations of the mechanism of bodily reaction accompanying affective states to other nervous mechanisms. The reflex cannot be inhibited by any voluntary effort on the part of the subject. I have sought for evidence of inhibition either of the response to physical or verbal stimuli in over a hundred subjects, but have never met with evidence of any direct voluntary power to either inhibit or modify the reflex. When the stimulus is not a maximal one the response may be modified to some extent by the activities of the subject at the time of stimulation. Fig. 3 shows the response to a moderately loud auditory stimulus, first, when the subject was expecting the stimulus; next, when he was engaged in mental arithmetic; and lastly (Fig. 4), when he was subjecting himself to a very painful faradisation applied to the sole of the foot. When I first obtained this result it seemed strange to me that the response to an irrevelant stimulus should be greater during the performance of arduous work than when the nervous system was keyed up to expect the

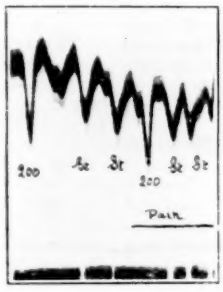
stimulus. The work performed, be it noted, was not responsible for any diminution of resistance per se. I have, however, constantly obtained this modification of the reaction to moderate stimuli, slight though it be, so long as the work on which the subject is engaged does not prove unduly irksome. When the resentment or the discomfort of strenuous work reaches such a pitch as in itself to produce a bodily reaction in the shape of a diminution of resistance, the response to the initial stimulus is diminished, just as we see occurred in this record when the subject was undergoing painful stimulation. When, however, proportionate responses when they are not separated at too great an interval and the general attitude and condition of the subject is approximately the same. After an initial intense stimulus with its concomitant response the resistance does not immediately rise to the old level, and so long as the slight general diminution in resistance continues the response to subsequent stimuli, of whatever their nature, will be somewhat greater than formerly. In the study of the galvanic reactions of neurotics undergoing a prolonged examination this tendency must not be overlooked. If a painful stimulus be repeatedly administered, and its

FIG. 3.



Reaction to uniform stimuli (prick). 1 and 2 before, 3 and 4 during, and 5 after mental arithmetic.

FIG. 4.



Reaction to uniform stimuli (prick) before and during painful faradisation. Graduation of 200 ohms.

FIG. 5.

Fatigue effect of galvanic reflex to uniform series of sound stimuli.

the stimulus is a maximal one, such as is produced by the firing of a pistol close behind the subject, it ceases to be possible to modify the response either by work or by any moderate degree of pain. Fig. 5 is the record of what is apparently a fatigue effect in the galvanic response to a series of uniform auditory stimuli. This apparent fatigue cannot be attributed to exhaustion of the effector mechanism of the response, that is either to the skin, the centrifugal nerves going thereto, or the nerve cells governing them, for if an adequate stimulus of a different nature to that of the series be administered at the beginning and at the end of the series it will be found to evoke approximately the same degree of response. Under the conditions of the experiment, which consists in the production of a short series of sounds of equal and moderate intensity, the effect cannot be due to fatigue either of the peripheral receptor mechanism or of the cortical receptor centres. We may therefore ascribe the progressive diminution of the response to some change occurring in the nervous mechanism connecting the receptor system with the effector system of the galvanic reflex. The term "progressive indifference" probably describes this change better than fatigue; for if in the middle of the series of moderate stimuli we intercalate one of greater magnitude we obtain a response approximately equal to that aroused by a stimulus of the same magnitude administered before the beginning of the series. It is noteworthy that after the intercalation of the powerful stimulus the descending series of responses is interrupted for the next two stimuli which show some degree of augmentation.

VARIATION OF RESPONSE WITH STIMULUS.

When the patient is subjected to a brief examination not lasting over ten minutes or so the magnitude of the response can be shown to vary directly with the strength of the stimulus. Fig. 6 shows the response to a series of break induction shots of increasing strength. This relation between the strength of the stimulus and the response is obviously a fact of some importance, but we must hesitate before we pronounce on the relative efficiency of any two verbal stimuli or stimuli evoked by the subject's own representations on the strength of an examination of the galvanic responses elicited. Even with simple and easily controlled physical stimuli two such stimulations of different strengths can only be counted upon to give administration be accompanied by some sound or movement on the part of the observer, after a time the repetition of this sound or movement will be in itself sufficient to produce a response equal to that caused by the stimulus. We shall, in fact, have established what Bechterew calls a conditioned reflex. Fig. 7 shows such a conditioned reflex. A painful stimulus was administered to a subject who was instructed to press a key which completed the circuit of an electric signal every time that he felt the stimulus. In addition to the motor reaction the galvanic reaction to the stimulus, was recorded. Every time that the painful stimulus which was an induction shock, was administered, the subject who sat with his eyes closed heard the click of the key that opened the circuit for the break induction shock. After the reaction had been repeated a sufficient number of times the key was clicked as usual, but the current was prevented from reaching the subject by a previous disconnexion of the circuit. On hearing the accustomed click the subject reacted in the accustomed fashion both by the signal and by a galvanic response, which will be seen to have been of no less magnitude than that responding to the last two occasions of the series when the induction shock was really administered. We shall see in the next lecture what light a consideration of these conditioned reflexes throws on the relation between the bodily response and the affective state.

PROBLEM OF SKIN RESISTANCE.

The relation of the initial resistance of the skin to the magnitude of the galvanic response is a very difficult point to determine. Waller has shown that the skin resistance undergoes a diurnal variation following closely the diurnal variation of temperature. I took advantage of this observation to determine the relation of the galvanic responses evoked by uniform stimuli to the initial skin resistance. Maximal stimuli were used, and for this purpose I found a pistol shot most convenient. A rough correspondence between the resistance of the skin and the galvanic reflex throughout the day is shown by Fig. 8. This chart represents the mean of observations conducted on three successive days, but the difficulties in obtaining the subject at any one time under approximately the same conditions are very great. For what it is worth, it seems to indicate clearly that the maximum response occurs round about mid-day when the

resistance of the skin is at its lowest. How far we are justified in assuming that cerebral activity is at its maximum at this time is very doubtful. Most people have the impression that their work is better performed either in the early morning or late at night, but this opinion is perhaps of little value. We judge of our work after all by much the same standards as those by which the world at large assesses our personal value. Everyone knows that the chief conditions of worldly success are great industry combined with a fair amount of stupidity, or—to put it less bluntly—with an absence of that self-criticism that so often destroys the power to accomplish things by leading us to inquire as to whether they are really worth doing. Similarly, the greater facility with which work is conducted at hours remote from the mid-day interval may simply be an expression of the abeyance of similar critical and inhibitory processes.

I have been unable, in spite of the large amount of material investigated, to secure any data as to a correlation between intelligence and the galvanic response that would appear to be sufficiently trustworthy to justify its inclusion in this review. In this connexion the work of Miss Waller appears to be highly important. She examined the galvanic responses of a class of 70 students to a series of standardised stimuli. The students shortly afterwards underwent an examination in physics. Correlating the marks obtained and the magnitude of the galvanic responses Miss Waller found that the average response of the higher placed half of the class in the results of the examination was greater than that of the lower half of the class. A further investigation on these lines is at present urgently needed.

IMPORTANCE OF LATENT REACTION TIME.

The latent time that occurs between the stimulus and the galvanic response is, as we shall see later, a matter of great importance in the elucidation of the significance of the bodily reactions. I have a large number of records, taken with the Einthoven galvanometer, which show the latent period in response to a variety of stimuli. To a physical stimulus, such as sound, the reaction time may be as long as 2·5 seconds, when the stimulus is a single loud tap on the table, whereas it may be as short as 0·8 second to a pistol shot; the latter figure was given by a young man with very large galvanic responses who was suffering from diabetes, a condition which we are accustomed to associate with hyper-excitability of the sympathetic system. The duration of the response is, in the case of a physical stimulus, conditioned primarily by its initial magnitude. As we have already noted, a response of great magnitude may be followed by an after-effect lasting for a considerable period, often three or four minutes. When we are dealing with verbal stimuli the latent period may be very long, the association processes necessary to evoke the response may be complex, and the duration of the response may be greatly lengthened owing to perseveration.

SPECIFICITY OF THE GALVANIC REFLEX TO NOCUOUS STIMULI.

I have now dealt with some of the main facts that have so far presented themselves from the study of the galvanic reflex, and I have especially dwelt on the nature of the stimuli that evoke this reflex. We have seen that to divide them into physical and psychical stimuli is from the objective point of view unjustifiable, since all these forms of stimulus have in common the property of injuring or inhibiting the normal course of vital activity. In future, in speaking of such stimuli, it will be convenient to assign to them collectively the same name that Sherrington has bestowed on those belonging to the physical class, and to refer to them as nocuous stimuli. The galvanic response is not the only type of response to nocuous stimuli that we know of. We have seen that it is an inevitable response incapable of any great degree of modification by other forms of activity, but this characteristic it shares with a number of other responses that we may study objectively. It has, however, one characteristic that at once makes its study of paramount importance in any objective investigation of neurosis, and that is that, alone of all the forms of bodily response that we shall study, it is specific to nocuous stimuli. It does not primarily occur as a bodily sign of the state of cerebral activity that we have considered already as effort.

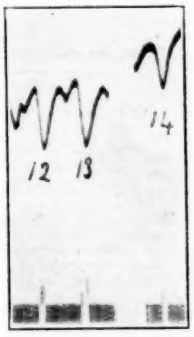
OTHER OBJECTIVE SIGNS OF RESPONSE TO NOCUOUS STIMULI.

Now, in investigating further objective signs of the response to nocuous stimuli we shall find that we have met with all these signs in the study of effort. The diffuse increase of muscular tonus that we have already seen to be manifested both by movements of the extremities and by induration of the muscle occurs also as a response to nocuous stimuli of sufficient intensity. Fig. 9 shows a record of the movement of the foot caused by increased tonus of the quadriceps as a response to a painful stimulus. Fig. 10 is the photographic record of the increase in tonus of the arm muscles to a nocuous physical stimulus recorded by the optical lever. The movements of the head recorded by the method described in the previous lecture are, however, of a nature different from that of those elicited by effort. You may remember that the tonic response to effort was

FIG. 6.

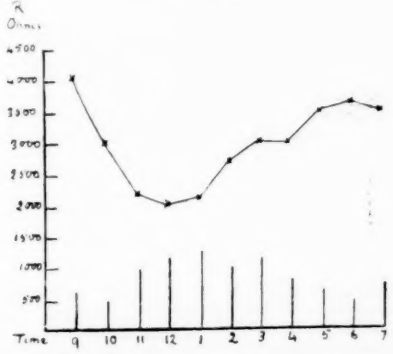
Response to series of break induction shocks. 2 coil at 10; 3 coil at 8; 4 coil at 6; 5 coil at 4; 6 coil at 2; 1 graduation 400 ohms. Final graduation omitted.

FIG. 7.



A conditioned reflex.—Upper line, the galvanometer, lower broad line the signal response. 12 and 13 are the last in a series of painful stimuli. For 14 the stimulus is short-circuited, but patient still responds on hearing the click of the key.

FIG. 8.



Graph showing rough correspondence through the day between skin resistance and galvanic reflex.

manifested by a forward movement of the head. A painful stimulus is responded to by a retraction of the head. This might appear to be an example of a purposive movement, the subject endeavouring to withdraw from the vicinity of the painful stimulus, but on applying the stimulus to the back instead of in front the same retraction of the head occurs, though in this case the subject is moving in the direction of the stimulus. It cannot, therefore, be compared to the type of reflex that occurs when a spinal animal withdraws the foot from a nocuous stimulus. Disagreeable and offensive verbal stimuli will also elicit this retraction reflex (Fig. 11), which—in contradistinction to the forward movement accompanying effort—appears, therefore, to have

FIG. 9.

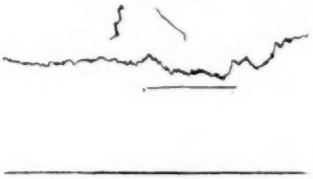


FIG. 11.

Opposite movements of head. Forward with effort (recitation). Backward in response to offensive (verbal) stimulus. Respiratory and circulatory movements shown.

some of the specificity to nocuous stimuli that characterises the galvanic reflex. The respiratory changes do not differ, so far as I have been able to observe them, from those associated with effort. Fig. 12 is the record of two interesting tracings obtained, one as the reaction to a painful thought and the other to anger. The response in both cases is manifested as a flattening of the respiratory curve that we have seen reason to associate with increased muscular tonus. I am aware that many observers have attempted to demonstrate the existence of special forms of the respiratory curve associated with specific affective states, but the lack of uniformity in their results, which depend on measurement of the expiratory and inspiratory excursions, have failed to

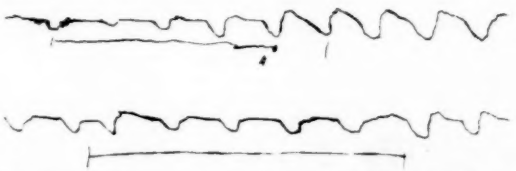
FIG. 10.

Photographic record of the increase in tonus of the arm muscles to a nocuous physical stimulus, recorded by the optical lever.

convince me that they are dealing with any specific reflex changes. The heart rhythm is accelerated in response to nocuous stimuli, but such acceleration, when it occurs, is of very short duration in response to a short-lived stimulus. With prolonged stimulation the cardiac rhythm is accelerated for the whole duration of the stimulus. Again, if the inferences drawn from measurement of the time relations of the cardiac cycle are to be trusted, it appears that the acceleration is due to depression of the vagal inhibitory and not to stimulation of the accelerator mechanism.

The evidence furnished by plethysmographic tracings of the vaso-motor reactions occurring in the limbs must be accepted with a certain amount of reserve. In the well-known Mosso plethysmograph as modified by Lehmann there are two possible sources of error which it is practically impossible to eliminate. First, a very small amount of displacement of the arm will cause a very marked effect on the plethysmographic curve and will be interpreted as an increase of volume if the arm be moved forward and as a decrease of volume if the arm be withdrawn ever so slightly from the plethysmograph. That such slight movements do occur and cannot be consciously guarded against is shown by the old experiments with an apparatus known as the "automatograph." In these experiments the partially flexed forearm is suspended in a cradle hung from a support. The movements of the cradle are recorded on an underlying drum and it is claimed that by this method it is possible to show that a disagreeable stimulus is responded to by retraction of the arm and an agreeable stimulus by its advancement. I have not adopted this method in my investigations, because I consider that it harbours many fallacies; but whatever the interpretation we may place on them, results thus obtained show that such movements certainly do occur. Another source of fallacy in the use of the plethysmograph becomes obvious from the evidence that I have submitted as to the diffuse increase in muscular tonus occurring as a bodily reaction in certain states of cerebral activity. Such an increase in muscular tonus must occasion an alteration of muscle volume simulating a vaso-constriction. I have dwelt on the shortcomings of the plethysmograph because we shall see later that results obtained from this instrument are the chief support for the assumption of a bodily response occurring in exactly the opposite direction to that elicited by nocuous stimuli. In order to avoid one source of error—that arising from slight movements of withdrawal or propulsion of the limb—I have designed a form of

FIG. 12.



Respiratory tracings. The upper tracing shows effect of anger. The lower that of grief. The period during which the subject was indulging in the thought of the vexations and the painful experiences is indicated by the straight line below the tracing. (To be read from right to left.)

plethysmograph that has yielded fairly satisfactory results in these experiments. It is in essence a light metal drum covered at either end by a stout rubber diaphragm. There is a circular hole in each diaphragm, large enough to allow the passage of the arm whilst permitting a firm gripping of the limb by the thick rubber. The arm is thrust through both diaphragms so that the hand and wrist project beyond the further one, whilst the proximal end is a couple of inches below the elbow-joint. The drum is connected to a type of Brodie bellows recorder in which the bellows is replaced by a thin rubber "condom." The plethysmograph hangs freely on the arm, which is supported by two blocks at the wrist and elbow. Using an instrument of this type, which cannot be affected by any slight movements of the arm, in the direction of withdrawal or propulsion, I have obtained records of diminution of limb volume that are in accordance with those obtained by previous observers. It will be noted, however, that this arrangement of the plethysmograph cannot altogether neutralise, though it sensibly reduced, the error that arises from changes in muscle volume as a result of

increase of tonus. The only method of plethysmographic recording that would be free from both these errors is that adopted by Weber who used an ear plethysmograph. I confess that the extremely disagreeable features of this method, which involves the working of large amounts of vaseline into the hair, have prevented me from proposing its use to the subjects of my experiments. Fig. 13 shows a photographic record of the plethysmographic and the galvanometric responses to a nocuous stimulus. It will be observed that the latent period is identical in the two forms of response.

RESPONSES TO BENIGN STIMULI.

Now so far we have considered the bodily response to nocuous stimuli, that as to stimuli that tend to disturb and destroy life, and we have, moreover, noted that the sensory concomitant of such responses has been a feeling of an unpleasant nature. We may now fairly envisage the question as to what are the responses to stimuli that tend to further and perfect life—what we will call benign stimuli—which so far as they have any sensory reaction affect us pleasantly. Since the galvanic reflex is the only response that we have so far been able to study that is specific to nocuous stimuli and is not elicited by effort, it is to this reflex that I shall first turn for an answer. I have found that to stimuli of a benign nature there is either no response at all or else a slow increase in resistance occurs; but this slow alteration of resistance is only to be noted when the preceding state is one of the low resistance that we consider to be indicative of general bodily activity. If, after a series of painful or vexatious stimuli the attention of the subject be diverted to more pleasurable matters, the lowered resistance rises gradually until a point above the initial neutral state has been reached. If a hungry subject be given a satisfying drink and appetising food the resistance will show a slow increase. If a subject who has taken up his position, rather dreading a series of irksome experiments with painful electrical shocks, be told that for that séance the observer only purposes to take some simple pulse records this welcome news is followed by a slowly developing increase of resistance. The response with which we are dealing has none of the brusque and decided characteristics of the galvanic response to nocuous stimuli; its slow and variable onset and the indefinite nature of the stimuli that tend to arouse it do not allow of any formulation of the latent period of this increase of resistance. I have never seen it occur under five seconds with the type of stimulus that I have been considering. This indefiniteness may partly be attributed to the method of experiment—to attempt to produce such a violent reaction as that which we characterise as joy is, under the conditions of the somewhat dreary experiments conducted in the laboratory, a practical impossibility. The muscular tonus response that has been found to be evoked by both effort and nocuous stimuli cannot, of course, give the same clear-cut answer as the specific galvanic reflex, but the tendency is in the same direction. When the painful stimulus is removed the muscular hypertonus relaxes slowly, and ultimately relief from pain is characterised by a far higher degree of relaxation than that found at the onset of the stimulus. This relaxation is well shown in Fig. 10. The pulse-rate becomes slower after the nocuous stimulus, and this slowing may be observed in the galvanometer curve of reaction to a pistol shot (Fig. 1). In this case, before the stimulus was administered, the pulse-rate had been more rapid than normal, and immediately after the stimulus was still further increased for a couple of beats and then becomes slower. We have here, therefore, a complex result of two different forms of excitation—the suggestion that a disagreeable experience is to be undergone, and the stimulus itself. It is characteristic of the cardiac response that its duration is almost confined to that of the stimulus itself; hence the slowing that occurs after relief from the stimulus may be actually present while the other forms of response, such as the galvanic reflex, are still in progress. The response, therefore, to a benign stimulus is a diminution of organic activity. Philosophers of all ages have frequently drawn attention to the superior efficacy of pain as a vital stimulus. So far as an objective study of these reactions has taken us the reaction to a benign stimulus is only presented as a relief from the previous activity occasioned by a nocuous stimulus. It is not possible here to follow the line of thought suggested by these experimental results and to inquire whether benign stimuli with their pleasurable sensory aspects should not be considered merely as an interruption of the stream of nocuous impulses that spur the organism to activity. Theophrastes, quoting Anaxagoras, tells us that to feel is to suffer ἅπασαν δαίσθησιν μετὰ λύπης. If we substitute for the definite presentation of the specific sensation the vague affective state that accompanies a nocuous stimulus, the dictum of the early Greek philosopher holds true. Pain is the fundamental fact and pleasure nothing but relief from pain. It will be objected that moments of great joy are certainly accompanied by the exhibition of bodily activity—the winning side cheer and clap their hands—the dog will bound with pleasure when he recovers his lost master. This difficulty is easily dealt with. Such exhibitions of activity are not specific responses to the benign stimulus. They are not directed to the prolongation or the curtailment of the bodily reaction to the stimulus. They appear to be a compound of at least two factors, the discharge of certain reflex activities that have been inhibited by the tension of the muscular system, and the appearance of a specific type of nervous activity—the instinct to communicate with others.

FIG. 13.

Simultaneous record of galvanic (G) and plethysmographic (P) responses to a prick, x.

A great deal of confusion has been occasioned by statements to the effect that the vasomotor reactions studied by the plethysmograph show an active dilator response to pleasurable stimuli which is in every sense the antithesis of the constrictor response to disagreeable stimuli. This statement, which is unfortunately copied from text-book to text-book, is based, as Shepherd has shown, on a very few experiments of Lehmann, which have not been confirmed by other observers. Using my own modification of the plethysmograph I have only succeeded in demonstrating the same type of slow return to the normal state from a vasoconstriction due to a nocuous stimulus that we have seen to occur with the galvanic response.

The objective study of these bodily responses to stimuli possessing feeling tone lends some support to the tridimensional theory of feeling of Wundt and the later somewhat similar view advocated by Royce. Without entering into any discussion of these questions it is still important for the understanding of neurotic disturbances to realise the plurality of the bodily responses that go to the make up of an affective state.

DONATIONS AND BEQUESTS.—By will the late Mr. Frederick Ernest Muntz, of Umberslade Hall, Warwick, has given among other bequests, £2000 to the Birmingham and Midland Free Hospital for Children; £1000 each to the Home for Incurables, Leamington, the Institution for Deaf and Dumb Children, the Royal Institution for the Blind, Birmingham University, and the Institution for the Feeble Minded, Knowle; and £500 to the Birmingham Y.M.C.A.

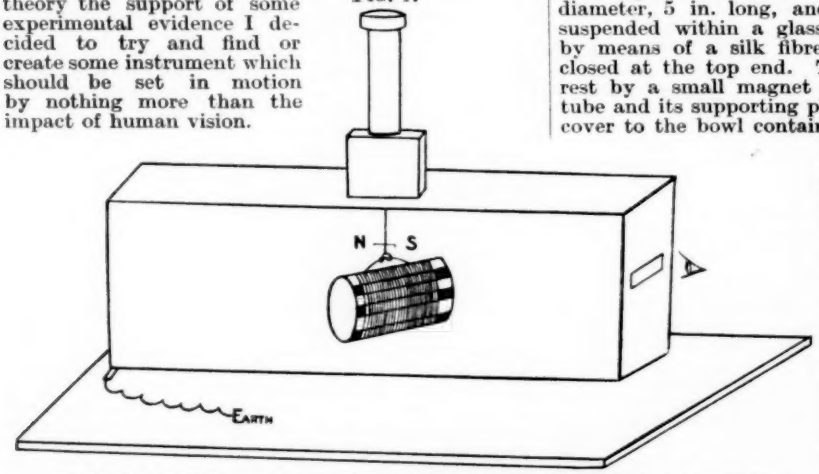
AN INSTRUMENT WHICH IS SET IN MOTION BY VISION OR BY PROXIMITY OF THE HUMAN BODY.[1]

BY CHARLES RUSS, M.B. LOND., M.R.C.S. ENG.,
LATE PHYSICIAN, ELECTRICAL DEPARTMENT, MALE LOCK HOSPITAL, SOHO.

ALTHOUGH the force or ray I am about to describe emerges from the human eye, and is therefore physiological, the means I employ for its demonstration involve the use of electrical and magnetic instruments. The need for the scrutiny of experts in the science of physics was therefore obvious. I have had the great advantage of giving successful demonstrations of the work to experts in physics, including five Fellows of the Royal Society, besides Doctors and Bachelors of Science. None of these physicists found any mechanical or electrical fallacy which could account for the effects which I demonstrate as due to human vision. They do not so far identify the ray or force as being of a known or unknown type.

The fact that the direct gaze or vision of one person soon becomes intolerable to another person suggested to me that there might be a ray or radiation issuing from the human eye. If there is such a ray it may produce an uncomfortable effect on the other person's retina or by collision with the other person's ray; it is a fact that after a few seconds the vision of one or the other will have to be turned away at least for a short time. Numerous everyday observations and experiences seem to support the possibility of the existence of a ray or force emitted by the human eye, and in order to give my theory the support of some experimental evidence I decided to try and find or create some instrument which should be set in motion by nothing more than the impact of human vision.

FIG. 1.



The horizontal strips are of paper, to fix the coil wires on the celluloid of the cylinder.

Description of Apparatus.

Within a metal box (Fig. 1) I suspended a delicate solenoid made of fine copper wire. This solenoid was wound upon a cylinder of celluloid and suspended by a silk fibre (unspun silk) 14 in. long; the silk fibre was contained within a long glass tube mounted in the roof of the metal box. Its upper end was attached to a cork stopper and its lower end was furnished with a small metal stirrup into which the solenoid could be hooked. Attached to the stirrup was a small magnet consisting of a short length of steel wire magnetised by a steel magnet.

The box was 3 ft. by 8¼ in. by 7 in., and lined with sheet aluminium. The far end of the box was closed by a sheet of window glass, and the near, or observer's end, was furnished with a thin glass or celluloid window which was also screened by a sheet of aluminium with a slot 3 in. long and 1 in. wide. A conducting wire connected the silk fibre with the aluminium of the box, which was earthed.

Method of Demonstration.

The solenoid was held steady by the magnet which naturally came to rest in the magnetic meridian (Fig. 1). If the human eye looks through the slot in the observing window and maintains a steady gaze at one end of the solenoid the latter will be seen to start into motion, which is usually away from the observing eye. If the gaze be now transferred to the true centre of the solenoid the latter stops, and if the vision is now applied to the opposite end of the solenoid the latter moves in a reverse direction to the motion first induced. This manœuvre may be repeated several times, each subsequent attempt being made only after the magnet has brought the solenoid to complete rest. Motion of the solenoid, though much reduced, was also obtained after interposing a column of water between the eye and the solenoid.

In view of later work it is possible that the solenoid is acting as one element of a condenser system—the air in the box being the dielectric.

Early in 1918 I had been impressed by the rapid induction of motion of the solenoid immediately after its replacement in its box or case. This activity soon fades to a minimal value which can always be obtained. Thinking that such activity might be due to some electrically charged state, I constructed some light condensers and tested the effect of vision on them. The form of condenser used was a celluloid cylinder having strips of lead or aluminium foil adhesively fixed to its inner and outer surfaces in symmetrical arrangement.

A large condenser of this type was made, 5 in. in diameter, 5 in. long, and weighing 10 g. It was suspended within a glass bowl 10 in. in diameter by means of a silk fibre enclosed by a glass tube closed at the top end. The condenser was kept at rest by a small magnet fixed above it. The glass tube and its supporting platform formed an airtight cover to the bowl containing the condenser (Fig. 2). The bowl was lined by aluminium foil except for small inspection areas at four diameter positions. For certain tests glass plates were also detachably mounted in a frame around the bowl with an air space between.

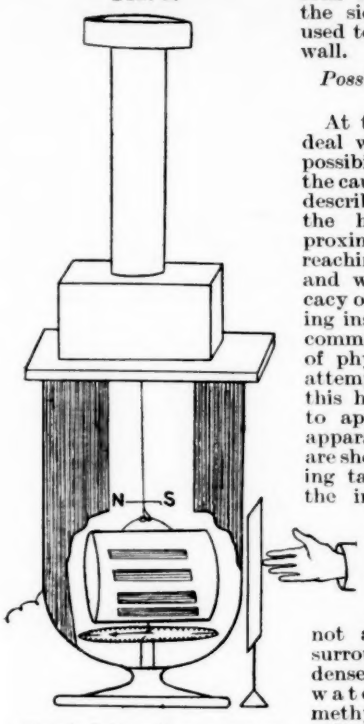
Although such a large condenser is only slowly set in motion by the human gaze, I decided to test the effect upon it of the body generally, and placed my hands on the glass case. I found the effect was much enhanced, for within about 20 seconds the condenser was set in rotation, and such motion might amount to 45° or even 90°. I noticed also that after producing this effect it only slowly returned to the zero position, in fact the return might require half an hour.

Time and Degree of Reaction.

The latent period and the degree of rotation obtained depend on the presence or absence of the extra glass plates which latter are also covered with foil. While producing this effect the operator's vision is assisting the rotation and also appears to determine the direction of the movement obtained—i.e., whether clockwise or counter-clockwise. To produce a rapidly acting model I suspended a sheet of celluloid 2½ in. by 4 in. inside a glass beaker. The celluloid was covered with gold leaf over an area of 2 sq. in. on each surface, and was suspended by a silk fibre and furnished with a control magnet. The glass beaker was covered inside and outside by aluminium foil except for inspection windows. If two fingers are placed on the vessel for two to three seconds and then removed the card is

[1] A paper on this work and the instruments and effects were demonstrated by the author at the Ophthalmological Congress at Oxford on July 8th.

FIG. 2.



The shaded portions represent metal.

seen to rotate towards the side of the hand used to touch the vessel wall.

Possible Influence of Heat.

At this point I will deal with the obvious possibility of heat being the cause of the motions described. Heat from the hands and body proximity is, of course, reaching the apparatus, and we know the delicacy of the heat-recording instruments at the command of the science of physics. I did not attempt to measure this heat, but decided to apply heat to my apparatus. The results are shown in the following table, and I think the inference is that heat is inadequate to explain the effects observed. I found the effects much reduced, though not abolished, after surrounding the condenser by a jacket of water, paraffin, or methylated spirit.

Heating experiments of the cases containing the condensers were undertaken in two ways: (1) Radiant heat from one or two candles 3 inches from the glass plates surrounding the large condenser (Fig. 2) were almost entirely negative up to periods of six minutes; (2) water heated to the temperatures shown in the table was placed in metal vessels against the glass plates, which were covered also with metal strips and the areas of contact arranged were several times as large as the contact area of the human fingers.

After placing the hands on the metal area of the guard plates the condenser moves after 30 seconds and usually travels through from 10° to 15° within two minutes. In the hot-water experiments there was no vision applied.

Hot Water in Metal Vessels on Sides of Case.

Glass guard plates covered with metal and paper.

		Min.				Min.	
1	Water at 40° and 42° C.	1–6 6–12	Zero. 3° A.	1	Boiling water.	1–6 6–12	Zero. 2°–10° A.
2	Water at 45·2° and 44·8° C.	1–2 2¼ 3 5	Zero. 2° A. Zero. Zero.	2	Boiling water.*	2 2¼ 3 5	Zero. 2° A. 3°. 2°.
3	Water at 45° C.	1 1¼–3½ 4–5	2° A. Zero. 2°.	3	Boiling water.	1¼ 2½ 4 5	Zero. 2° A. 2°. 1°.

* Temp. at end of experiment = water 77° and 73° C.; hot sides of bowl, 17·2°; cold sides of bowl, 13·3°. A = Anti-clock.

Effects of Vision Alone.

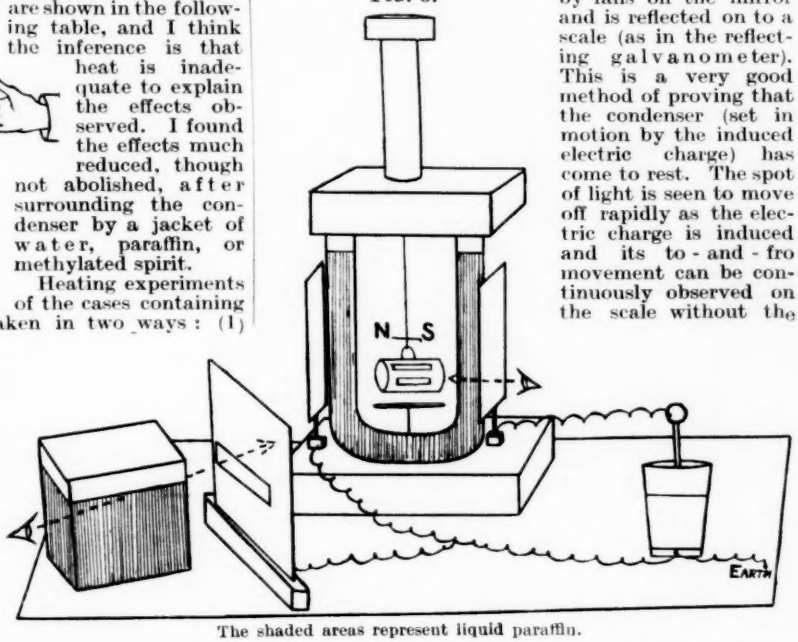
Glass Rod Method.—Remembering the activity referred to when replacing the coils and condensers in their cases, I decided to try the effects of charging them electrically by induction. If a glass rod rubbed with silk approaches the glass case (Fig. 3) the condenser goes into rotary motion, and when this has ceased it comes to rest in the magnetic meridian.

It is now sensitive to vision, and may, therefore, not be looked at until it has come to rest. This moment may be ascertained by a glance at its reflected image in a mirror 10 feet away. When at rest its sensitiveness to vision only lasts about 30 seconds, depending on the force of the initial swing given by the rod's approach. If the eye looks through the fluid and slot at the optimum period it will see the condenser go into active rotation which may amount to 30° or 45°. The sensitiveness is brief and can only be renewed by re-charging with glass rods.

This method is one I used at first, but it is difficult and not quite satisfactory when demonstrating to others; I have therefore improved upon it.

Spot of Light Method.—A small mirror is fixed to the stirrup on the end of the silk fibre. This mirror moves with the stirrup and its attached condenser. Light from a lamp near by falls on the mirror and is reflected on to a scale (as in the reflecting galvanometer). This is a very good method of proving that the condenser (set in motion by the induced electric charge) has come to rest. The spot of light is seen to move off rapidly as the electric charge is induced and its to-and-fro movement can be continuously observed on the scale without the eyes being directed at the condenser. When the spot of light has been seen to come to rest it will be found that human vision now directed at the condenser sets it, together with the spot of light, into rapid motion, which may be so large as to take the latter quickly off the scale. Special caution is, however, needed in connexion with this method, for I failed repeatedly in trying to use it until I had noticed that no light from the lamp must be allowed to fall on the condenser. This is easily managed by interposing a screen of black paper or the equivalent between the lamp and the condenser. The little mirror in the stirrup is above the level of the condenser, and the small beam needed to give the spot of light is easily provided and focussed by means of a lens if desired.

FIG. 3.



The shaded areas represent liquid paraffin.

Charge Plates Method.—In Fig. 3 the method is shown. Two metal plates are embedded in blocks of sulphur and mounted by the sides of the instrument. One is connected to the outer coating of a Leyden jar and is also connected to earth. The other plate embedded in the insulating sulphur is connected to the inner coating of the jar by a spring or chain and cap contact with the knob of the jar. The Leyden jar is charged by contact with an electrical friction

machine giving several thousand volts. At the moment of applying this electrical pressure to the plates the condenser goes into active rotation. After a moderate charge from the Leyden jar this swing subsides and the condenser comes to rest in the magnetic meridian position. If, however, the charge is large the condenser will be held for some minutes with its axis at right angles to the meridian. In this case the electric stress overpowers the magnetic pull. If the operator now looks into the open end of the condenser he will see its movement through 20–30°; when the eyes are closed it returns to its former position. Note must be made of the direction it takes. We know that left to itself the south end of the magnet will slowly turn towards the earth's south pole as the electric stress fades. If vision of the operator causes the south end of the magnet to go towards the earth's north pole I call it an anti-magnetic effect. If, however, his vision causes the reverse motion it has the same value as an effect provided it is found on removing the force (closing the eyes) that the condenser (and of course its attached magnet) returns to the stressed position at right angles to the meridian.

An important point must be made of the primary swing. It is vital to the production of the sensitiveness to vision of the condenser. If for any reason there is no swing then there will be no movement after vision is applied. In case the swing was operating by making in its passage through the air in the vessel a frictional charge on the condenser, I tested the matter another way. Taking a bar magnet and moving it round the glass case one makes the control magnet in the stirrup swing, and of course its attached condenser also swings. In this way no electric batteries or rods are used to set up the primary swing. The effect of sensitiveness to vision is still observable, though I think less actively than when using the Leyden jar method; but the experiment serves to emphasise the need of the swing and perhaps to throw light on the true nature of the vision effects. If repeated observations are made involving frequent charging of the plates the motion of the condenser becomes lazy under the static charge, but recovers after a little rest.

The electric charge will only hold for a few minutes on the jar and plates in damp weather. If dry conditions exist many vision effects may be obtained from only one charge. If, after charging, the condenser having come to rest, one discharges the jar by the insulated tongs, the condenser will show a rapid swing at the moment of electric discharge from the jar. By means of an accumulator and coil and spark gap I have tried to maintain the charge on the jar, so far with moderate success. As yet it is not easy to keep the condenser quite still, but when the apparatus is improved it will become independent of the humidity factor.

Controls and Precautions.—This system of the stressed plates is an extremely sensitive indicator of an electrostatic change. The operator must be still and seated behind a glass or celluloid screen so that no water vapour from nose or mouth can reach the glass case. His eyes are closed and no movements of limbs or other objects must disturb the vicinity of the electric field. When told by the assistant (or seeing by the spot of light) that the condenser is at rest, he will look at it and perceive that his vision has set it in motion, which can be measured on the scale. If the eyes are not opened or only the hand has been kept in the operating position there will be no effect. There must, of course, be no vibration of the room by traffic, or any mechanical disturbance of the supporting bench.

Darkness Tests.—I did four tests which seemed to give a positive result, but many more such tests would be required before a decision could be made on this point.

Probable Nature of the Effect.—There is an electrical change in the retina accompanying vision. There are also the electric changes in muscles when in action, and these will have associated electric fields. The eye muscles include the ciliary and iris and the oculomotor group. Whether the fields from these sources are adequate to account for the effects cannot be answered at present.

Heat.—Besides the evidence in the table the arrangements in Fig. 3 probably exclude this agency as a cause of the movement obtained.

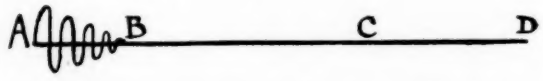
Electrostatic Force.—A force of this type cannot pass a fine metallic grid, and may therefore be considered unlikely to produce the activity observed.

Electromagnetic Force.—This group of vibrations includes a large number of rays ranging from the X ray to the wireless waves. The influence of light from the lamp seems suggestive of an influence of this type, but no critical tests have been done on these lines.

Summary.

Human vision can disturb the electrostatic state of an enclosed system. After the condenser has come to rest there must still exist a turbulence of the medium in all the types of experiment described. This turbulence appears to be reinforced or amplified by the applied vision, and is shown by (1) the activity shown by opening and closing the container; (2) the activity after rotating the condenser by the bar magnet; (3) the activity following the slight heating of the medium by the fingers on the guard plates; (4) the activity shown during the fading of the electric charges between the plates. Of course, at the time of operating these instruments by any of the above methods the turbulence is not sufficient to cause motion—i.e., the condenser has come to rest. Since the particles of any gas are always in motion it is probable that the effects of vision are only produceable when the turbulence of the medium is critical—i.e., of a certain intensity. If the turbulence has fallen below this degree the activity to vision is lost. This latter point is shown by the fact that activity to vision is lost long before the sparking power has disappeared from the Leyden jar (Fig. 4).

FIG. 4.



At point A the charge is applied causing the condenser's motion which has ceased at point B (1–2 minutes). Period B–C = the period for demonstration that the condenser is now sensitive to vision. This period lasts from three to fifteen minutes or more depending on the magnitude of the initial motion imparted to it at A and upon the dryness or humidity of the air. Sensitiveness to vision is lost at point C, and period C–D represents the further period during which a spark is still obtainable from the Leyden jar.

I do not propose to say more at present as to the probable nature of the force accompanying the act of human vision of which these experiments are the evidence. Instead I restrict the claim of my work to our possession of the instrument which affords the evidence of the force, and which is the limit of the title of this article. The only reference in the literature I have met was mentioned to me by a friend in 1919. It is a destructive criticism by Lord Kelvin of the work by a French physicist on the "Supposed New Force." After reading Lord Kelvin's paper one must, I think, endorse his view that the author failed to establish his views, as he would not even enclose his instruments to meet the objections of air or heat currents.[1]

During the course of this work, which has occupied spare time since December, 1917, I have had the advantage of criticism and suggestions by my brother Prof. Sidney Russ, Prof. A. Porter, F.R.S., Prof. Rankine, and others as to the physical aspects of my experimental arrangements.

[1] On the Supposed New Force of M. J. Thore. By Lord Kelvin. (Phil. Trans., 1887, vol. clxxviii., p. 451.)

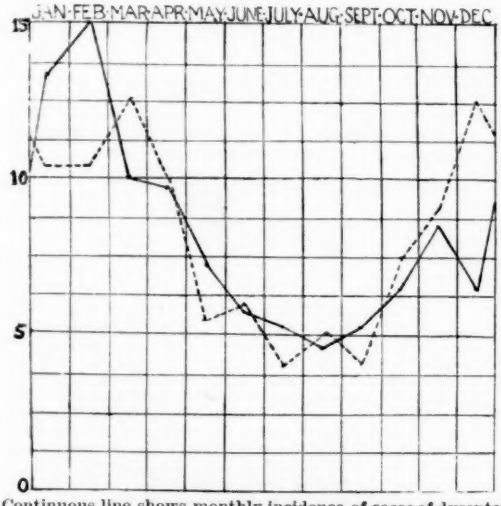
THE ÆTIOLOGY OF BACILLARY DYSENTERY IN ASYLUMS.

BY W. S. DAWSON, M.A., M.B. OXON., M.R.C.P. LOND., D.P.M.,
AND
W. MOODIE, M.D. ST. AND., D.P.M.,
ASSISTANT MEDICAL OFFICERS, CLAYBURY MENTAL HOSPITAL.

THE question of asylum dysentery is of such interest to those concerned with the care of the insane that from time to time much useful investigation has been undertaken in the hope of establishing its ætiology. The present state of our knowledge may be summed up in the words of Tidy, who says, in his "Synopsis of Medicine," "No specific organism is present, but bacteriological and serological investigations have indicated bacilli of the Flexner group." The study of a small series of cases which occurred in Claybury Mental Hospital during the earlier months of this year has yielded such definite results that it appears worthy of special note.

In 1900 Mott and Durham made a comprehensive study of dysentery in Claybury, and, although they were unable to isolate any specific organism, they showed clinically and post mortem that it resembled the bacillary type of the disease rather than the amœbic. Many observers have from time to time claimed to have discovered amœbæ in the stools of patients, but their results require confirmation.[1] In spite of all efforts to control it, dysentery has in the past been the cause of a large amount of the sickness in asylums, as well as a considerable percentage of the mortality. Thus, during the year 1919, in 80 county and borough asylums 1722 cases of dysentery were notified, and of these 384, or 20 per cent., died, forming 3 per cent. of the total number of deaths.

CHART 1.



Continuous line shows monthly incidence of cases of dysentery in 80 county and borough asylums expressed as percentages of the total for 1919. Interrupted line shows monthly incidence of cases of dysentery in Claybury female wards, 1909-1920.

Contrary to the accepted view that dysentery is a disease of hot weather and is generally spread by flies, the highest incidence of cases in Claybury occurs during the winter months. Chart 1 is constructed from a monthly average of cases occurring in the female wards during the years 1909 to 1920. The published statistics of the Board of Control for all the asylums of England and Wales show roughly a similar incidence.[2] Figures from the Ministry of Pensions and the Army for 1920, kindly supplied to us by the Ministry of Health, show a remarkable similarity to our own, over 50 per cent. of the total number of cases being reported during the period of January to April. It would therefore appear that asylum dysentery spreads not so much through flies as through some more direct method from patient to patient, especially during the winter months, when the patients are confined within doors for a greater number of hours per day on account of climatic conditions.

[1] Archives of Neurology, vols. ii. and iii.
[2] Report of the Board of Control for 1919, Part I.

Carriers.

It is usually taken for granted that certain patients who have suffered from dysentery become carriers, and are therefore capable of disseminating the disease for a more or less protracted period after the acute stage has passed. One of our patients, who has relapsed seven times in eight years, is probably a carrier. She has been free from acute symptoms for several months, and examination of her fæces at the present time fails to reveal the presence of an organism of dysentery. On the other hand, slight transient attacks, which may pass unnoticed in a previously healthy patient, may yet be of great danger as a source of infection. For example, a patient who was confined to bed for mental reasons on one occasion passed a loose motion in which a small quantity of blood was noticed. This was kept for examination, and produced a Flexner type bacillus on culture. The serum of this patient, at the end of the eighth week, agglutinated Prof. L. S. Dudgeon's antigen in a dilution of 1 in 125.

The question of relapsing cases who are probably carriers has been raised, and it is interesting to note in this connexion that of 590 patients who suffered from dysentery in Claybury during the past 12 years, 18 per cent. relapsed once, 6 per cent. twice, and 3 per cent. three times. In mild cases the dysentery bacillus disappears from the fæces in a few days, and the patient has apparently made a rapid recovery. We have, however, noted that not infrequently a relapse has occurred within a few weeks after the fæces had been reported negative on several occasions. A patient who has had an attack of dysentery thus remains a possible source of infection to others, especially as mild, transient relapses may pass unnoticed in patients who are too demented to appreciate slight irregularities in their bodily functions.

To ensure the complete eradication of the disease from asylums, it would therefore appear necessary to carry out a very complete scheme of permanent isolation, and to treat every dysentery case as a potential permanent carrier. This principle is at present applied in Claybury, and all cases in the epidemic here reported occurred in wards where patients known to have previously suffered from dysentery were housed.

Bacteriology.

Seven cases occurred during the first four days of the outbreak, and from the fæces of all of these a bacillus of the Flexner type was cultivated. The patients affected were isolated in single rooms, and a strict watch was kept for any suspicious cases of diarrhœa, several of which occurred during the subsequent two months, and were investigated. During that time an identical bacillus was found in five more cases. The system of isolation of positive cases was persisted in, and, at the time of writing, no case of clinical or bacteriological dysentery has occurred for over a month.

The method employed in examining the fæces was as follows:—The specimen was taken from the motion and sent to the laboratory on a swab similar to a throat swab. This was found to be a very handy, clean, and efficient method of collecting specimens. If preferred, the swab may be introduced into the rectum of the patient, and the mucus from the wall of the rectum thus obtained directly. The latter method was employed extensively during the war, and was found to be excellent. It also has obvious practical advantages.

MacConkey's medium was used for plating, of a reaction of + 4 acid. The reaction of the medium is

all-important, and must be adjusted with scrupulous care. Phenolphthalein was used as indicator in the titration, which was carried out at boiling point. The plates having been incubated for 24 hours, suspicious colonies were transferred to Russell's double sugar agar, in which Andrade's reduced fuchsin was used as indicator. On this medium it is usually possible to observe gas formation after 12 hours' incubation, and so to weed out the non-dysentery organisms.

The growth obtained on Russell's medium was then agglutinated macroscopically on a slide with Dreyer's Oxford Flexner serum, the reaction, if positive, appearing in about 15 seconds. If agglutination appeared thus the case was treated as a positive. It was therefore possible to send out a laboratory report on the specimens of fæces well within 48 houss. This rapidity of diagnosis is extremely important from an epidemiological point of view. As a confirmatory test the organisms were subcultured and grown on the "sugars," and, in addition, were agglutinated macroscopically with Dreyer's Oxford serum to full titre. It was found in practice that no organism which passed the rough test failed to pass the more detailed and delicate one.

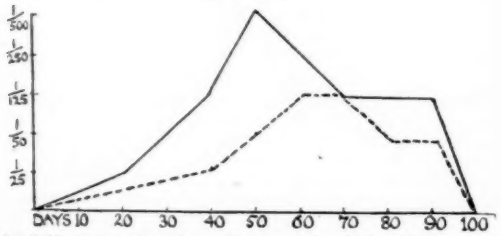
The bacillus was non-motile and Gram-negative, and, while producing acid without gas on glucose and mannite, it left lactose and saccharose unchanged. It is interesting to note that from two of the cases of diarrhœa from which the Flexner type bacillus was not isolated, *B. pyocyaneus* was obtained in almost pure culture. In the case of one patient who died, although there was extensive ulceration of the intestine reaching practically as high up as the duodenum, only cultivations from the rectal contents yielded the Flexner type bacillus, none being present in cultures taken from the higher parts of the intestine or the internal organs.

Agglutination Tests.

Frequent agglutination tests were carried out on the serum of all those patients whose fæces had been proved positive bacteriologically, and also on some cases whose fæces did not yield positive results. Dreyer's standard Oxford antigen was used in all cases, and latterly another Flexner type antigen, kindly supplied to us by Prof. Dudgeon, of St. Thomas's Hospital, was used in addition.

Several facts of fundamental interest were collected. It was found that, with Oxford antigen, the first trace of agglutinins appeared at the end of the

CHART 2.



Agglutination titre at various periods of the disease. Continuous line, with Dudgeon's antigen. Interrupted line, with Dreyer's antigen.

sixth week, and that agglutinins had disappeared at the end of the fourteenth week; while with Prof. Dudgeon's antigen agglutination began to appear about the beginning of the fourth week, and had disappeared at the end of the fourteenth week also. Maximum agglutination was obtained with Oxford antigen between the eight and tenth week, and with Prof. Dudgeon's antigen in the seventh week (Chart 2). No case in which the fæces were negative bacteriologically gave a positive agglutination with either antigen. Many agglutination tests were performed; using the organisms isolated from the cases themselves as antigen. The curves thus obtained conformed roughly with those given by Oxford antigen and that of Prof. Dudgeon.

Shaw Bolton and Nabarro [2] have carried out extensive investigations on the agglutinins in dysentery. They state that a positive reaction occurs early in the disease, and that many apparently healthy persons, who are not known to have suffered from dysentery, give a positive reaction, thus raising the question of the possibility of unsuspected carriers. Our results are not in accordance with their findings.

Conclusions.

1. It is of paramount importance that the fæces of all cases of clinical dysentery and diarrhœa be examined in the laboratory. 2. Having regard to the fact that primary attacks and relapses may be so slight as to pass unnoticed, and the possibility of every case remaining a chronic carrier, very strict observation and a system of permanent isolation are necessary in order to prevent the spread of the disease. 3. Agglutinins are present in the blood of affected patients only after the fourth week of the disease, and therefore agglutination tests are of little diagnostic value.

SEROLOGICAL TYPES OF PNEUMOCOCCI IN LOBAR PNEUMONIA.

A STUDY OF 100 CASES.

BY FRED. GRIFFITH, M.B., CH.B. VICT., D.P.H.

(From the Pathological Laboratory of the Ministry of Health.)

THE study of the immunological types of pneumococci has been shown by the workers of the Rockefeller Institute in America and by Lister in South Africa to be of great importance in the prevention and treatment of lobar pneumonia. The existence in this country of the types defined by the American workers had been established, but the information which has been published in respect to their distribution is still somewhat scanty.[1] I therefore propose to contribute my observations on the serological characters of strains from 100 cases of lobar pneumonia which I have classified according to the American method. The standard type strains upon which the classification is based were presented by Prof. Flexner to Sir George Newman, who made them available for the purposes of this inquiry.

Preparation of Monovalent Agglutinating Serums in Rabbits.

Adult rabbits were used, being immunised by the intravenous inoculation of pneumococci in ascending doses. The suspensions of pneumococci were obtained by centrifuging broth cultures, the deposits from which were generally diluted with some uncentrifuged broth culture. The inoculations were made on three consecutive days and were followed by a rest of from five to seven days. For the first three series of inoculations the culture used was killed by heating to 60°C. for half an hour, and was prepared freshly for each series. The immunisation was continued with living culture, beginning with a fraction of a cubic centimetre of broth culture and gradually rising until the whole of the deposit of 20 c.cm. of broth culture was administered at a dose. The total period of treatment was 10 weeks; the animals were bled within 10 days after the last inoculation. The serums were tested upon pneumococci from broth culture suspended in salt solution, and gave for types 1 and 2 a titre of 1:320 and for type 3 1:640. These serums were re-tested after being preserved in a sterile condition in the ice-chest for 10 months; they showed no appreciable diminution in potency. No reaction with heterologous strains—e.g., type 1 serum against types 2 and 3, &c.—was obtained in dilutions of 1 in 20.

In a second series of rabbits some observations were made on the progress of immunisation. Treatment commenced with suspensions of heated broth culture, preserved with 0·5 per cent. carbolic acid, and continued for five weeks, inoculations being made on three successive days, followed by an interval of rest. The serums then showed titres ranging from 1:20 to 1:40 for the four type 1 rabbits, and 1:4 only for the three type 2 animals. The treatment was continued, but with a fresh heated suspension of each type;

[1] A report on this subject has been published by R. R. Armstrong, Brit. Med. Jour., Feb. 19th, 1921.

a series of four successive daily inoculations was given, each rabbit receiving the deposit of 300 c.cm. of broth culture. A week later the serums were re-tested. The type 1 rabbits showed little improvement but the three type 2 serums now agglutinated the homologous culture in 1:10, 1:20 and 1:40 dilutions respectively. Then immunisation was continued with living culture, and at the end of a further six weeks the serums were re-tested. Two type 2 serums agglutinated to 1:80 and 1:160 and one type 1 serum to 1:160. The other three type 1 rabbits died 58, 82, and 83 days after the beginning of immunisation. They had tolerated doses consisting of the deposit of 10 to 30 c.cm. of living broth culture and up to a few days before death appeared to be in good health. In each case, however, advanced pneumococcal endocarditis of the left auriculo-ventricular valves was found. Type 1 pneumococci were recovered from the vegetations and were found to be highly virulent for mice. Serum derived from the heart blood of one of the rabbits after death protected mice against infection with the above strain. Thus the injected pneumococci set up disease in spite of the presence of protective substances in the blood.

It would not be safe to generalise from these few experiments in immunisation, because so much depends upon the idiosyncrasies of the individual rabbits; they suggest, however, the necessity of using considerable amounts of culture and the probability that more active and more permanent agglutinating serums can be prepared by the use of living culture than with culture killed by heat.

Isolation of Pneumococci.

In 88 out of the 100 cases of lobar pneumonia which I have investigated the pneumococci were isolated from sputum; in 10 they were obtained from consolidated lung, and in 2 from both lung and sputum. The specimens were generally at least 24 hours old before examination, and were often sent to the laboratory through the post. The material was inoculated intraperitoneally into a mouse, which was usually found dead or dying the next morning. Cultures were made from the heart blood on blood agar plates and into blood broth. If the blood of the mouse was found to contain bacteria in addition to pneumococci, a pure culture was made from single colonies from the plate. Where the mouse died from uncomplicated pneumococcal septicæmia the strain was carried on from the blood broth culture. After incubation at 37°C. over night, the blood broth cultures were placed in the ice-chest and were sub-cultured every two or three weeks, so long as the strain was required. In order to preserve the strain without loss of virulence, the mouse's spleen was removed and placed in a sealed tube after being dried in vacuo according to Heim's method.

Determination of Type.

The agglutination tests were made with the rabbit serums prepared, as described above, from the standard strains of types 1, 2, and 3. For the purpose of rapid identification of type the American method was followed, with a slight modification.

The peritoneal cavity of the mouse which had died after inoculation with sputum, &c., was washed out with about 5 c.cm. of salt solution. The washings were centrifuged at a low speed to throw down the fibrin and cells. The supernatant fluid was mixed with an equal quantity of a 1 in 10 dilution of each of the three type serums. This differs from the American procedure, in which either the pneumococci from the washings are re-suspended in salt solution and used for an agglutination test, or the perfectly clear supernatant fluid is used for a precipitin test. The modification, which was adopted on account of the lack of a sufficiently high centrifugal speed, appears to be quite satisfactory. If the pneumococcus belonged to one of the three types a reaction occurred almost immediately. The fluid became more turbid and clumps rapidly formed, the process being hastened by incubation. The readings were taken after the lapse of an hour only, as often a precipitate of fibrin occurred in all the tubes after more prolonged incubation. In the case of a type 3 infection the peritoneal washings were generally mucinous, but this condition was also found on a single occasion in both a type 1 and a type 2 infection.

The result of the test of the peritoneal washings has always been confirmed by an agglutination test with a whole broth culture of the strain. Where the reaction was negative with all three serums after repeated tests and the culture was bile-soluble, the strain was classed provisionally as belonging to the American type 4 pneumococcus—i.e., the heterogeneous collection of strains not conforming to any of the three "fixed" types.

Incidence of the Types.

As a result of the tests described above, my classification of the pneumococci obtained from an unselected series of 100 consecutive cases of lobar pneumonia is as follows:—

Type	..	..	1	2	3	4
No. of cases		..	24	35	10	31

Discussion of Results.

For the purpose of comparison with the above classification, the following table gives the American results. It is taken from the monograph of the Rockefeller Institute, 1917, and shows the percentage occurrence of the various types of pneumococcus in 454 cases of lobar pneumonia.

Pneumococcus type.	Incidence.	Pneumococcus type.	Incidence.
1	33·3	3	13·0
2	29·3	4	20·3
2 (atypical)* ..	4·2		

* The incidence of atypical type 2 pneumococci has been determined only during the last two years.

In the American series types 1 and 2 taken together account for 62·6 per cent. of the cases; in the English series which forms the subject of this report the corresponding percentage is 59. The incidence of cases of lobar pneumonia attributable to type 4 pneumococci appears to be higher in this country than in America. One has to consider the possibility, since the great majority of the specimens consisted of sputum, that some of the strains isolated may be accidental oral contaminations and not the organism to which the pneumonia was due. This is most likely to be the case where type 4 pneumococci have been obtained, since this type has been shown to be a common inhabitant of the normal mouth. At the same time I do not regard this as a probable event, as the sputum was not cultured directly but was inoculated into mice. The pneumococci obtained after passage through this animal may reasonably be considered the most important as regards virulence and predominance in the sputum.

Specificity of the Types.

The following is my experience as regards the validity of the American classification. The two serological groups of pneumococci which have been designated types 1 and 2 respectively by the American observers are equally well defined. Type 3 differs from the first two not only serologically, but generally shows also distinctive morphological and cultural characteristics. The simple agglutination test is sufficient for identification of each of these three types and it is unnecessary to apply the method of absorption of agglutinins. I have not done many experiments to determine whether this latter method would reveal individual differences between members of the same group. In an absorption experiment made with five type 2 strains upon types 1 and 2 serums, the type 2 serum was exhausted of agglutinins and the type 1 serum remained unaffected.

The unclassified strains in my series, designated type 4, did not react with any of the three type serums, 1, 2, and 3, in a dilution of 1:20. This group of strains contains many types, as Olmstead[2] has shown. Six types, including the American atypical types 2 A and 2 B, have so far been defined in the present investigation, but the classification has not been completed.

It is quite clear that there are three main antigenic components in the pneumococcus group; these three components appear to exist in a relatively pure condition in the three standard American types of the Rockefeller Institute. It is possible that if serums from unselected strains are used cross-agglutination between the three chief types and their respective serums may occur. Agglutinating serums prepared from horses appear to be less selective than rabbit serums.

[2] Journ. Immunology, ii., p. 425, 1917.

This work has been made possible by the kindness of the medical officers and pathologists of various Poor-law institutions in providing material, and I wish to express my indebtedness to Dr. J. R. Perdrau, Dr. R. C. Harkness, Dr. W. Brander, and many others. I am also indebted to Prof. E. E. Glynn, who has kindly sent me specimens of each of the three American "fixed" types which he has isolated from cases of pneumonia. These I have found to conform to my own standards.

THE DIAGNOSIS AND TREATMENT OF STERILITY IN THE MALE.

BY KENNETH M. WALKER, M.A. CAMB., F.R.C.S. ENG.,

IN CHARGE OF VENEREAL DEPARTMENT, ST. BARTHOLOMEW'S HOSPITAL; SURGEON WITH CHARGE OF GENITO-URINARY CASES, MILLER HOSPITAL FOR S.E. LONDON.

ALTHOUGH the subject of sterility has long attracted the attention of the medical profession, and although much has been written on its causes and treatment, it cannot be claimed that the practical results obtained up to the present are satisfactory, or that when consulted for sterility the medical man of to-day can hold out to his patient much more hope of successful treatment than the medical man of 50 years ago. Our failure in this respect is in the main due to our ignorance of the physiology of reproduction. Attention has been focussed almost entirely on questions of anatomy. The discovery of a contracted cervix or of a retroverted uterus is hailed with delight by the medical man consulted for sterility. Even although he can recall innumerable cases of conception in women suffering from similar disabilities he feels that retroversion is an abnormality, and that, as it is a condition capable of correction, the first essential to treatment is the remedying of the retroversion. So also is it in the case of the male. The husband of a sterile wife is examined for gross abnormalities. If the external genitalia appear well formed and spermatozoa are discovered in the semen he is passed as normal.

In text-books dealing with sterility in the male, hypospadias, epispadias, cryptorchism, exstrophy of the bladder, stricture, and impotence are given as causes of sterility. In actual practice such conditions, with the exception of the last-named, are seldom encountered, and therefore as causes of sterility their importance is trifling. Yet, as all modern statistics show, the male is frequently the partner responsible for a sterile marriage. If, therefore, the possibility of male sterility is to be excluded something more than a search for gross abnormalities must be undertaken. The examination must be as exact and as thorough as modern methods will permit. It is with an idea of indicating the lines along which such an examination should be made that the following has been written.

Method of Investigation.

The investigation of the male suspected of sterility resolves itself into two parts: a careful overhauling of the genital tract, and an analysis of the seminal fluid. At the preliminary visit an inquiry is made into the past history, special regard being paid to infection, venereal or otherwise, and to the existence or not of any abnormalities or difficulties in the sexual life of the individual. Although it cannot be claimed that the examination of a condom specimen is an ideal method of investigation it nevertheless furnishes information of great value. In connexion with this examination the following points should be borne in mind:—

1. The specimen should be as fresh as possible. Although mobile spermatozoa may occasionally be found ten hours after emission little reliance can be placed on an examination in which so long an interval has been allowed to elapse. It must also be remembered that the optimum temperature for the conservation of mobility is comparatively low. If active spermatozoa be placed in an incubator at 37° C. movement will, as a rule, have disappeared at the end of two hours. At 27° C. mobility is more likely to be retained.

2. A period of abstinence from sexual relations of a week's duration must be prescribed previous to the examination.

3. In the event of the first specimen proving abnormal at least two subsequent examinations must be made before an adverse report is issued. It not infrequently happens that after failing to find spermatozoa on two occasions an investigator will discover their presence in the third specimen submitted for examination.

The semen to be regarded as satisfactory must contain a plentiful supply of well-formed and mobile spermatozoa, and must reveal no abnormal elements such as pus cells, indicative of an unhealthy condition of the genital tract. In considering the character of the spermatozoa and estimating the fertilising efficiency of the semen the following points must be noted:—

1. The number of spermatozoa seen in an average field.
2. The percentage of spermatozoa perfect, imperfect, or deformed.
3. The percentage of spermatozoa that are mobile, their degree of mobility, and the time during which mobility persists.

Oligozoöspermia.

Lode has estimated that about 260,000,000 spermatozoa are emitted in one ejaculation. The faintly acid reaction of the vaginal secretions and its abundant flora are not conducive to the long life of the spermatozoa, so that but few reach the cervical canal. It is easy to see, therefore, that a diminution in the number of spermatozoa in the semen lessens the chance of fertility. The number of spermatozoa found in the semen is reduced in extreme youth and in old age. It is, moreover, subject to variation in the same individual according to fluctuation of general health, and in all probability to seasonal changes. Although man has escaped from the rigid œstral cycle, to which the majority of the lower animals are bound, it seems probable that his freedom is not absolute. When one recalls the enormous increase that takes place during the breeding season in the size of the testes and accessory glands of the sparrow and the hedgehog, it would appear anything but surprising that the sexual activity and fertility of man should also show some tendency to a seasonal fluctuation.

Amongst the causes of a pathological oligozoöspermia are inflammatory conditions of the genital tract and their sequelæ, sexual excesses, certain diseases of the nervous system (both functional and organic), chronic alcoholism, and, indeed, any condition causing a marked impairment of the general health.

Azoöspermia.

The consistent absence of spermatozoa from the semen may be due to one of two causes: (*a*) the existence of a mechanical obstruction in the genital tract; (*b*) the absence of spermatogenesis in the testes.

Diagnosis.

Before any prognosis can be given or any treatment suggested it is essential than an exact diagnosis should be arrived at, and the case allocated to one of the above two classes. For this purpose the genital tract must be carefully overhauled. The situations at which obstructions are usually found are at the lower pole of the epididymis and in the course of the ejaculatory ducts. These obstructions are almost invariably the sequelæ of old inflammatory reactions, and in 60 per cent. of cases are due to gonorrhœa. Next in importance to gonorrhœa as a cause of obstructive sterility comes tuberculosis. Even when one epididymis alone has been attacked azoöspermia is likely to result, owing to involvement of the prostate and vesicles. Out of 22 cases of genital tuberculosis examined by the author, 20 gave indications of prostatitis or vesiculitis, and were therefore liable to obstruction of the ejaculatory duct. It is not claimed that these prostate lesions were necessarily tuberculous in nature, but merely that the prostate or vesicles gave evidence of chronic inflammation, and were, therefore, capable of exercising an unfavourable influence on the fertility of the patient. Syphilis as a

cause of azoöspermia is of less importance on account of its tendency to be unilateral, to involve the testis rather than the epididymis, and to clear up with treatment.

The examination of the genital tract should include a posterior urethroscopy in order that the opening of the ejaculatory ducts may be inspected. If there is any doubt about their patency methylene-blue may be injected into the vas on each side and its passage into the urethra observed. Should no signs of obstruction be detected the absence of spermatozoa in the semen probably indicates lack of spermatogenesis. To confirm this the testis may be punctured with a hypodermic needle and a search made for spermatozoa in the fluid drawn off. The operation is a painful one and a fine needle should be employed. If repeated examinations of the testicular fluid fail to reveal the presence of spermatozoa, aspermatogenesis must be diagnosed. This occurs when the tubules have atrophied as the result of a severe orchitis—e.g., mumps. It is also found, as shown by Mott, in association with various mental conditions, in some cases of cryptorchism, in advanced malignant disease anywhere in the body, and occasionally in chronic alcoholism. Old age, although productive of oligospermia, is not as a rule a cause of aspermatogenesis. I have examined the testes of a large number of old men dying of prostatic enlargement or its sequelæ and have been surprised how rarely spermatogenesis entirely fails, even in senile cases.

Necrospermia and Oligonecrospermia.

A certain degree of oligospermia is usually associated with the necrospermia, as is also the appearance of abnormal types of spermatozoa. Amongst these are large-headed and small-headed forms, spermatozoa without heads or double-headed monsters. The condition is generally associated with inflammation in the genital tract, and pus cells are discovered in the semen. Statements to the effect that spermatozoa become motionless in the presence of pus or blood are erroneous; but as inflammation is often accompanied by an acidity of the secretions pus is inimical to the activity of the spermatozoa. Necrospermia calls for careful examination of the genital tract for signs of prostatitis and vesiculitis. The appearance of an excess of crystals and amyloid bodies in the semen is not uncommon in this condition. Of the exact significance of this I am doubtful.

The Accessory Sexual Glands.

The rôle of the accessory glands, and notably that of the prostate and vesicles, is unknown. G. Walker showed that excision of both prostate and vesicles rendered rats sterile, whereas their breeding power was apparently unaltered by removal of only one of the glands. Ivanoff succeeded, however, in impregnating rodents by means of spermatozoa drawn directly from the testes. But even although the secretions of the prostate and vesicles may not be essential to fertility they are undoubtedly of considerable importance.

It is probable that there is some overlapping in the function of the two glands, as their degree of development is subject to enormous variations throughout the animal kingdom, absence of the one gland being compensated for by a considerable degree of development of the other. Although in man the prostate and vesicles may appear very different in structure, in other animals, notably the rhinoceros, the vesicles and prostate are so similar in appearance that it is difficult to say where one ends and the other begins. Whatever may be their exact function it is certain that the accessory glands have a very considerable bearing on fertility, and that their secretions, as well as adding bulk to the semen, provide a fluid favourable to the survival of the spermatozoa subsequent to emission. For this reason the condition of the prostate and vesicles should be carefully investigated in any potential case of sterility. Further investigations will be required before the true significance of the accessory vesical glands is understood.

Prognosis and Treatment.

As a result of a conscientious examination it is possible to arrive at a much more precise prognosis in the case of the male than is possible with the female; for whereas nature plays the chief rôle in producing sterility amongst women, disease is the chief factor amongst men. The fertility of a man can, indeed, be expressed as a percentage according to the number of active well-formed spermatozoa found in the semen, and the case returned as 80 per cent., 60 per cent., 50 per cent., &c., efficient. If this system be adopted it will soon become apparent to the observer how many husbands show a diminished number of healthy spermatozoa in the semen, or else give evidence of chronic inflammatory lesions of the genital tract, and consequently, although not absolutely sterile, are relatively so.

In a series of 87 childless marriages in which the wife had been declared normal, Wolbarst found the following incidence of trouble amongst the husbands: 57 per cent. suffered from azoöspermia, 35 per cent. from oligonecrospermia, and 13·5 per cent. from oligospermia. It must also be borne in mind that the mere fact that a normal number of healthy spermatozoa have been found in the semen, and that these retain their mobility for several hours after emission, affords no guarantee that the same mobility will be retained when the semen becomes mixed with the female secretions. To determine this specimens must be taken from the cervix or fundus uteri three or four hours after coitus and examined according to the method advocated by Hühner. As, however, such interesting questions as the action of the female secretions on the spermatozoa and the possibility of agglutination and incompatibility, &c., belong to the subject of female sterility they will not be discussed here. Suffice it to say that the well-known hostility of the vaginal secretion to the life of the spermatozoa appears to be the result of its bacteriological content rather than of its acid reaction.

The treatment of sterility in the male will depend on the category in which the case has been placed. An azoöspermia due to the occlusion of the ejaculatory ducts is generally associated with a chronic prostatitis for which the appropriate therapeutic measures must be adopted, including, if necessary, catheterisation of the ducts through a posterior urethroscope. The latter may be a simple or an extremely difficult, if not impossible, operation, the determining factor being the situation of the openings. If the obstruction is the result of bilateral epididymitis the operation of vaso-epididymostomy, devised by Martin and modified by Lespinasse, may be undertaken, provided that the existence of spermatogenesis has been proved by means of direct puncture of the testes. For the condition of oligo- or necrospermia due to vesiculitis a prolonged course of massage and dilatation must be carried out.

When spermatogenesis is defective or lacking, treatment is of less avail. Attention may be paid to the habits, mode of life, and general health of the patient, and a course of orchitic or lymphatic gland extract given in the hopes of exerting an influence on the defective action of the testis. Occasionally aspermatogenesis will be found in men who otherwise appear to be perfectly normal.

Although at the present moment it may be impossible to find an explanation for such a puzzling condition of affairs, it is not unlikely that the key to the riddle will be provided by an increased knowledge of the relationship of the testes to the endocrine glands. But as yet little is known of the influence exerted on the testis by the hierarchy of the ductless glands, and the suggestion that certain cases of aspermatogenesis may be explained in terms of endocrinology must be regarded as purely speculative. Whether the suggestion be right or wrong there can be little doubt that if progress is to be made in the treatment of sterility less attention must be paid to the anatomy of reproduction and more to its physiology.

Clinical Notes:

MEDICAL, SURGICAL, OBSTETRICAL, AND THERAPEUTICAL.

EXTRUSION OF A RENAL CALCULUS CAUSING A SINUS IN THE LOIN.

BY H. J. ORR-EWING, *M.C.*, M.D., B.S. LOND., M.R.C.S. ENG.,
ASST. MED. OFFICER, ENGLISH MISSION HOSPITAL, JERUSALEM.

THE following case is recorded as unusual, and presenting special features of interest:—

History.—N. G., a native Arab village woman, aged about 30, came to hospital from Nablous on Oct. 18th. She stated that she was suffering from a wound in her back, which had been discharging for a year. She said that she knew of no cause for this "wound"; no history was obtainable of injury, acute illness, pain, or disability of any kind. In the Moslem idiom, she stated that it was "Min Allah"—in other words, it had developed spontaneously; apart from the wound she felt very well.

On examination she proved to be a fine, apparently healthy woman, who had all her life been accustomed to the hardest manual labour in a country where all the heavy work is done by women. Nothing abnormal was discovered in chest or abdomen; the spine showed no tenderness, deformity, or rigidity; the urine was quite normal, specific gravity 1015, slightly acid, no albumin, no blood, no casts, no deposits of any kind visible to the naked eye. Over the left loin, about 2 in. from the middle line, at the level of the first lumbar vertebra, was a wound, or sinus, discharging yellow pus of a thin consistency; there was no urinary element in the discharge. The sinus passed downwards and outwards; a probe was inserted and a foreign body was discovered lying 1 to 1¼ in. from the surface. This body felt like dead bone. A provisional diagnosis of tuberculous abscess was made. The difficulty lay in the origin of the "dead bone"; the wound was above the crest of the ilium, quite a distance from the vertebra, and the twelfth rib could be traced intact above. The patient was admitted to hospital, where her temperature for three days remained subnormal and her pulse-rate 70–80.

Treatment.—On the 22nd she was anæsthetised and a transverse incision was made with a view to enlarging the opening of the sinus. A probe was now passed beyond the foreign body, and the sinus found to go directly in the direction of the left kidney. The supposed bone was grasped by necrosis forceps and pulled out through the enlarged exit wound. It was found to be a large renal calculus, roughly circular in circumference, and somewhat loaf-shaped. It was encrusted thickly with what was presumably uratic substance, and the interior, I imagine, was uric acid (I did not cut it up owing to the patient's desire to possess the trophy); the diameter of the stone would be about five-eighths of an inch. The sinus was then thoroughly cleared, packed with iodoform and drained, the remainder of the wound being sutured. She has made a good recovery: in no way affected by a temperature of 101° F. the night after the operation, and 103·5° the next night; this proved upon blood examination to be due to the ubiquitous malarial parasite, and speedily yielded to appropriate treatment. The sinus is healing up from the bottom, and although once in the daily dressing I washed out of the wound some gravelly material, there has not been the slightest urinary odour, nor any evidence of the presence of urinary matter in the discharge.

Remarks.—The woman, who was carefully questioned in view of the findings above, still denied any history of pain such as renal colic, and stated that she never had any pain during micturition, never suffered from frequency, nor had she had any passage of gravel. Her obstetric history had been uneventful. The history in these cases is notoriously inaccurate, but there seems no reason to suspect deception. The patient is an exceptionally intelligent woman for her class and race. In these days such cases must be fairly rare; even in Palestine the native usually seeks medical advice comparatively early. Nothing either in the history, symptoms, or urinary investigation led us to suspect the renal cause of the trouble; true, there were difficulties in the spinal caries diagnosis, but tuberculosis, especially of bones and joints, is very prevalent amongst the Fellaheen and Bedouin Arabs, and to suspect renal calculus in the absence of any indications of an affection of the kidney seemed to be uncalled for.

I have no access to the literature of similar cases, but I seem to remember that most, if not all, of the recorded cases have given rise to suspicions as to their causation, by some, at any rate, of the symptoms and signs so conspicuously lacking in this case. It was quite a minute before I realised that I was looking at a renal calculus, and not at the possible result of an attack with a slung stone from the rear.

A FURTHER NOTE ON THE LYMPHOIDOCYTE AND ITS CLINICAL SIGNIFICANCE.

BY A. KNYVETT GORDON, M.B. CANTAB.,
MEDICAL SUPERINTENDENT OF THE VIROL RESEARCH LABORATORIES.

IN a previous communication to THE LANCET of July 19th, 1919, I recorded the finding of lymphoidocytes—which are regarded as the parents not only of leucocytes and lymphocytes but of red cells also—in the circulating blood in fatal illnesses other than primary anæmia. I have since extended these observations, and give a brief summary of the results.

Twenty-six patients were selected, who were described as moribund, and who certainly appeared to be in extremis. Lymphoidocytes were found in 24, associated in every case with a marked leucopenia and the presence of leucoblasts—the parent both of leucocytes and lymphocytes—and in six cases with a few myelocytes also. The diagnosis is as follows: Diabetic gangrene 3, carcinoma with generalised metastases 3, senile decay 2, advanced tuberculosis 6, cardiac valvular disease with broken-down compensation 7, severe malaria 1, relapsing fever (with presence of the characteristic parasites) 2. All of these subsequently died. The two remaining somewhat unexpectedly recovered, and the lymphoidocytes could no longer be found. One was suffering from alcoholic pneumonia and cirrhosis of the liver, and the other from influenzal pneumonia.

In addition, I have observed 15 cases of primary disease of the hæmopoietic organs—namely, lymphatic leukæmia 6, "pernicious" anæmia 3, secondary carcinoma of the bone-marrow 2, myeloid leukæmia 2, Banti's disease 2, in all of which death took place, and lymphoidocytes were present in the circulating blood. The proportion of lymphoidocytes in the films varied in the first series from 3 to 11 per cent., and in the second from 5 to 20 per cent. I do not, however, suggest any correlation between these proportions and the severity of the disease, as it is by no means certain that the proportion of primitive cells of various types does not vary from time to time when they are present.

These observations show that the appearance of the primordial cell in the circulation is not confined to disease of the hæmopoietic organs, though I have been unable to find any record of their presence in man except in the leukæmias. So far as this goes, it serves, I think, to emphasise the importance of studying the histological features of the blood cells instead of merely relying on their numerical proportions as found in a mechanical count where they are classified under rigid types. It is frequently possible not only to trace in the same film gradations between the recognised mature cells and their progenitors, but also to observe a shift towards one or the other end as the patient improves or gets worse, and it is therefore probable that as our knowledge of the biology of the blood cells deepens, the opinion of the pathologist on the extent of the patient's resistance to disease in general will become of increasing service to the clinician. The value of a mechanical count with the hæmocytometer is but small, unless it be supplemented by a histological study of the cells themselves in properly stained films. For this purpose I have found Leishman's stain useful for a general survey of the film, but for the finer details Pappenheim's panoptic stain is preferable and less liable to variation. Latterly I have come across no fewer than five different samples of alleged Leishman stain which were quite useless for hæmatological work, and could not be made to give the characteristic reactions by any manipulation whatsoever.

Reviews and Notices of Books.

MEDICAL ANNUAL, 1921.

Bristol: John Wright and Co.; London: Simpkin, Marshall, Hamilton, Kent and Co. Pp. 616. 20s.

THIS volume, the thirty-ninth of the series, embodies a summary of the published records of progress in surgery and medicine during the past year by a number of distinguished authors. The reviews under each heading are clear, supported by full references to original papers, and the amount of space allotted to each disease is well proportioned. Amongst articles of special interest may be mentioned that on encephalitis lethargica. We are glad to note that autoserum therapy has been practised in this disease—the experimental results obtained with rhesus monkeys in the homologous condition polio-encephalitis afford strong indications as to its probable value. The treatment of ankylostomiasis by oil of chenopodium administered by duodenal tube is advocated and the results as regards the anæmia are apparently highly encouraging. Recent work on deficiency diseases is reviewed and consideration of the subject is brought up to date. An excellent summary of work on the kidney is included under the heading nephritis; Dr. Mackenzie Wallis's recent observations on functional albuminuria are discussed and reference is made to Barach's work on the relation of albuminuria to prolonged violent muscular exertion. The differences between chronic parenchymatous and chronic interstitial nephritis are indicated, and the dietetic treatment appropriate to each variety of the disease is fully described.

The cognate problems of the chemistry of the blood are succinctly reviewed by Dr. O. C. Gruner. His article on the cytology of the blood, beautifully illustrated by original coloured plates, presents a theory so novel in its conception and apparently subversive of our most cherished ideas, not only on the origin of blood cells but on the whole subject of body metabolism and the part played by enzymes in vital processes, as to read like a fairy tale. We regret that he could not even outline the experimental results on which his far-reaching generalisations are based, but his message is fascinating and suggestive, and many will doubtless avail themselves of the extensive bibliography on which he has based his sketch to follow up the subject for themselves. On the surgical side, Dr. Robert Hutchison reviews the latest medical and surgical treatment of gastric and duodenal ulcer. The relationship of ulcer to carcinoma is dealt with in an article on the surgery of the stomach. An article on the surgery of the thorax emphasises the satisfactory progress which has been made in the treatment of empyema, bronchiectasis, and abscess of the lung; perhaps a larger section might have been devoted to the newer aspects of this important branch of surgery. A special section on orthopædic surgery from an American source is devoted to a review of all that is most recent in a branch of work which is highly progressive, both in this country and abroad.

The book is attractively produced, clearly printed, and provided with a useful index, supplemented by ample cross-references under corresponding headings in the text.

DISEASES OF THE EAR, NOSE, AND THROAT.

Intrinsic Cancer of the Larynx and the Operation of Laryngo-Fissure. By IRWIN MOORE, M.B., C.M. Edin., Surgeon to the Hospital for Diseases of the Throat, Golden-square. London: Hodder and Stoughton. 1921. (University of London Press.) Pp. 147. 20s.

Mr. Irwin Moore seems to have read nearly everything that has been written on his subject, and has produced a monograph which is crammed with references; indeed, one might almost complain that the author lays so much stress on the work of others and so little on the results of his own clinical experience. He devotes comparatively little space to the clinical aspects and diagnosis of the disease, and he makes no mention of that form of senile tuberculous infiltration of the vocal cord which is so readily mistaken for epithelioma. But he rightly emphasises the fact, which cannot be too widely made known, that the majority of cases of intralaryngeal cancer remain undiagnosed until the disease has advanced too far for removal by the relatively safe and simple operation of laryngo-fissure. Not sufficient notice is taken of the early symptom of hoarseness; everyone in whom hoarseness persists for more than a few weeks should have the vocal cords thoroughly inspected. More than half the book is occupied by a careful account of the technique of the operation of thyrotomy, or laryngo-fissure, and this section is beautifully illustrated and full of valuable detail, including descriptions of several instruments designed by the author.

This monograph cannot fail to be most useful to any surgeon about to perform the operation of laryngo-fissure.

Diseases of the Ear, Nose, and Throat in Childhood. By DOUGLAS GUTHRIE, M.D., F.R.C.S., Surgeon to the Ear and Throat Department, Royal Hospital for Sick Children, Edinburgh. London: A. and C. Black. 1921. Pp. 88. 5s.

THIS is a very short epitome of diseases of the ear, nose, and throat as they affect children, and is too brief to be of great practical value. Some diseases, very rare in children, such as nasal polypus and Vincent's angina, receive mention, while only four lines are devoted to retropharyngeal abscess, which is an important affection of infancy. The volume is not likely to be useful to medical men, as they are already possessed of the elementary knowledge it contains; but it should prove helpful to nurses and child-welfare workers, and will serve a good cause if it stimulates their interest in the treatment of common and important diseases of childhood.

A Guide to Diseases of the Nose and Throat, and their Treatment. Second edition. By CHARLES A. PARKER, F.R.C.S. Edin., Consulting Surgeon to the Throat Hospital, Golden Square; and LIONEL COLLEDGE, M.B., F.R.C.S., Surgeon to the Ear and Throat Department, St. George's Hospital. London: Edward Arnold. 1921. Pp. 583. 25s.

THIS text-book, intended especially for post-graduate students, has been considerably altered and in parts entirely re-written. The work suffers somewhat from a lack of orderly arrangement. A few operations on the larynx and trachea are described in the preliminary section under general methods, while others are discussed under the headings of the affections for which they are designed. Thus, thyrotomy is found on p. 74 and Lack's modification thereof on p. 547; laryngostomy for stenosis is mentioned on p. 76, while other methods of treating this disease are described under syphilis on p. 139 and under perichondritis on p. 482; but laryngeal stenosis is nowhere discussed as a separate entity. The second section deals with the complications of general diseases, including tubercle and syphilis; such difficult subjects as the diagnosis of tuberculous laryngitis have therefore to be discussed before the student has reached an account of simple laryngitis, and the action of nervous diseases in producing paralyses of the vocal cords is considered early in the book, while the paralyses themselves are described in the end. In spite of these comparatively minor defects, the book is a most useful one; of medium size, it contains a great quantity of accurate information, is eminently sane and free from fads, and has been brought thoroughly up to date. A notable feature is the completeness of the description of such affections as usually receive but scant attention in text-books. The book should prove of great value to post-graduate students and practitioners.

A TEXT-BOOK OF GENERAL PATHOLOGY.

Second edition. By J. MARTIN BEATTIE, M.A. N.Z., M.D. Edin., M.R.C.S., L.R.C.P. Lond., and W. E. CARNEGIE DICKSON, M.D., B.Sc., F.R.C.P. Edin. London: William Heinemann. 1921. Pp. 496 + xlv. 31*s.* 6*d.*

THE second edition of this text-book has been carefully revised and considerably enlarged, both in the size and the number of the pages, and fresh chapters have been added on the granulomata and on fever. The features which assured success on first appearance have been preserved, and the additions can only enhance the popularity. The early chapters on the cell in health and disease and the degenerations are well done, though the section on jaundice is scarcely worthy of the rest. The section on the disturbances of the circulation is equally satisfactory, and the discussion on the pathology of infarction is particularly good. The chapters on inflammation and repair are original and up to date, and are enriched by some fine plates and figures from a thesis by Dr. J. W. Dawson. The treatment of neoplasms, though not inspiring, is adequate, and the chapter on animal parasites is unusually elaborate.

So far we have nothing but praise for an excellent text-book, but we must enter a word of protest against the illustrations. The numerous coloured plates are beautiful, and the drawings from Dr. Dawson's thesis leave nothing to be desired, but of the rest of the couple of hundred illustrations it may be said that they are immeasurably inferior to the text; they serve to point the moral that photographs can never be anything but sorry substitutes for skilled drawings. And though the liberal use of varied type may be appreciated by the student reading for examinations, for others it has a stop-press suggestion which is distinctly irritating.

ELECTRO-THERAPEUTICS FOR PRACTITIONERS.

Second edition. By FRANCIS HOWARD HUMPHRIS, M.D. Brux., F.R.C.P. Edin. London: Henry Frowde and Hodder and Stoughton. 1921. Pp. 300. 21*s.*

THE second edition of this work has been considerably enlarged. Four new chapters have been added, which deal with the uses of electricity in the treatment of diseases of the nervous system and the organs of special sense; a chapter is devoted to the galvanic, faradic, and sinusoidal currents, and another to radio-therapy. The other chapters have been enlarged to a greater or less extent. The chapter in the first edition dealing with Incandescent Light now includes an account of the Tungsten Arc Ultra-Violet Light and its indications. The uses of electricity for the treatment of diseases of the genito-urinary system are described in the chapter on enlargement of the prostate. The plan of the book has not been altered; it is a series of essays on some of the uses of electricity in medicine, describing the various methods which the author employs and the results which he has obtained.

Workers in electro-therapeutics will find much of interest in the work. The use of the high candle-power lamp for hastening recovery in cases of disease of the antrum and accessory sinuses after drainage has been established is a very practical piece of information; common colds, can, according to Dr. Humphris, often be aborted by the same treatment. Those who are in charge of the electrical departments of large hospitals and have to treat the chronic obstinate cases which have resisted the efforts of other departments are not likely to obtain so much success as is claimed for electrical measures by the author of this book; and after all, it is by the results obtained in cases that resist simple methods of treatment that the powers of electricity must be judged, especially when elaborate and costly apparatus is required. There is, however, not the least doubt that electrical treatment can procure results in the treatment of the kinds of case above mentioned when other methods cannot, and Dr. Humphris's work provides a useful guide to the maladies for which this treatment should be applied, particularly those, such as dermatological and gynæcological cases, which are seldom sent to the electrical department. The author, who was formerly President of the American Electro-Therapeutic Association, makes frequent reference to the work of American specialists. The book concludes with a useful appendix on the melted paraffin wax bath, and a glossary of electrical and electro-medical terms.

THE STOMACH AND ABDOMEN FROM THE PHYSICIAN'S STANDPOINT.

By WILLIAM RUSSELL, M.D., LL.D., ex-President Royal College of Physicians, Edinburgh; Professor-Emeritus of Clinical Medicine, Edinburgh University. London: Baillière, Tindall and Cox. 1921. Pp. 329. 15*s.*

THE chief value of this book lies in the clinical descriptions of cases, 99 of which are included, giving a series of clear pictures of many of the more important diseases of the abdominal viscera. Dr. Russell is able to select from a wide experience, and his survey of the evolution of clinical teaching on such subjects as appendicitis should be of great interest to the present-day student. In the early portion of his book, which deals with gastric disorders, no mention is made of the recent developments in clinical methods for the examination of gastric secretion, though a closer acquaintance with such methods cannot but modify to an appreciable degree our views on the disorders of the chemical functions of the stomach. In particular Dr. Russell leaves uncertain what figures he takes as an index of hypochlorhydria, while his teaching that this condition is associated with delay in gastric emptying is contrary to the views of the majority of modern gastro-enterologists.

We have found no references in this book to such important subjects as nephritis, pancreatitis, or colitis; on the other hand, the author devotes whole chapters to the Cirrhoses of the Liver, Diseases of the Œsophagus, and Coli Infections of the Urinary Tract. A series of instructive X ray photographs illustrates the volume.

DIAGNOSTIC AND THERAPEUTIC TECHNIC.

Third edition. By ALBERT S. MORROW, A.B., M.D., F.A.C.S. London and Philadelphia: W. B. Saunders Company. 1921. Pp. 894. 40*s.*

IN this volume are set forth detailed descriptions of many of the various diagnostic and therapeutic procedures which often receive only cursory reference in general text-books. The fact that a third edition has been called for is sufficient proof of its appreciation by the profession, and there can be no question that such a book must be of service to members of any branch of medical practice. The author is eclectic in his choice of methods, fair in his judgments, and clear in his descriptions. There is an excellent and concise account of all possible methods of anæsthesia, whilst transfusion of blood is adequately described and illustrated. The Carrel-Dakin method of disinfection of wounds is given a chapter to itself. The latter part of the book deals with the technique of examination of the various regions of the body.

Though most of the information and teaching can be relied on some of Dr. Morrow's statements will not find general acceptance. Thus on p. 80 he writes: "For strangulated hernia of any variety local anæsthesia should always be the choice." Most surgeons would not assent to this statement.

There are some surprising omissions. We can find no mention of Janet's method of irrigation for gonorrhœa, and in describing the urethroscope no reference is made to the inflation of the urethra by air. The term sigmoidoscope is not found in the book, and the long form of proctoscope described is of a more clumsy pattern than many sigmoidoscopes in common use. The illustrations—nearly 900 in number—serve well to indicate the methods described, but it seems unnecessary to insert 12 illustrations

showing how to pass a urethral sound. In Fig. 298 the line of the lung in relation to the ribs is inaccurate. The style of writing is easy and clear, though split infinitives have no terrors for Dr. Morrow, and his words are occasionally ill-chosen.

The book deserves to be in the library of every practitioner.

PRIESTLEY IN AMERICA, 1794-1804.

By EDGAR F. SMITH. Philadelphia: P. Blakiston's Son and Co. 1920. Pp. 173. $1.50.

THE average Englishman's knowledge of Priestley consists in the impression that he was an unpopular and heretical Radical who discovered oxygen and whose house was burned down by a mob. These facts are true, but few know that Priestley was also a learned natural philosopher, a man of letters, and a citizen of the French Republic, to which last circumstance the burning of his house in 1791 was due. He left Birmingham and was for a short time in charge of a chapel at Hackney, but finding that his opinions rendered life in England unendurable removed to America in 1794. It is at this date that Mr. Smith's little book begins, and he has produced a very readable account of Priestley's life in America by collecting various incidents reported in contemporary newspapers and books. No doubt Priestley was glad to arrive in a land which was Republican in government and where religious liberty existed in theory, if not, as is apparent here and there from Mr. Smith's extracts, altogether in fact; but our sympathy goes out to him on account of the numerous addresses of welcome to which he had to listen and respond. He was invited to the post of Professor of Chemistry at Philadelphia, but he declined to accept it. For some reason or other Philadelphia did not appeal to him, a dislike which was shared by John Adams, second President of the United States, for, as Priestley says in a delightful letter, "John Adams, when he first came down to Philadelphia fresh from Boston, stood aghast at this life into which he was suddenly thrown and thought it must be sin. But he rose to the occasion, and after describing in his diary some of the 'mighty feasts' and 'sinful feasts,' says he drank Madeira 'at a great rate and found no inconvenience.'" Priestley, however, does not seem to have conquered his aversion, for he remained at Northumberland, Pennsylvania, where he had a house and where he died in 1804.

We congratulate Mr. Smith, who we gather from his preface is a chemist, upon a very interesting little book, although we wish that he had given the references for the various excerpts which he has quoted.

JOURNALS.

School Hygiene. No. 2, Vol. XII. London: Adlard and Son. 1*s.* 6*d.*—It is gratifying to note the revival of this journal. The present number contains some interesting material, including a full report of the Conference of Educationists on Punishment in Schools. The Conference supported the resolution of the Medical Officers of Schools Association deprecating caning on the hand, which seems to be confined entirely to the public elementary schools. There are two interesting papers from the Edinburgh Conference of Scottish Medical Officers of Schools. Dr. A. MacGillivray, in his survey of the educationally blind child, favours full correction of myopes, and is of the comforting opinion that the vision of the race has probably not deteriorated at all in the last 7000 years. The skin diseases of school children have been very thoroughly investigated and treated in Edinburgh, and Dr. Norman Walker gives his experience of the last dozen years, adding some observations on the general medical outlook. Dr. C. J. Thomas, who has had more experience than anyone in this direction, draws attention to many points in connexion with the employment of children in theatres. An article on the public health aspect of physical exercises, by Dr. James Kerr, shows how the Ling system, while still necessary, has failed in popular attraction. He asks for a system having emotional content, and having regard to the herd instinct innate in man, wishes to socialise exercise so as to make it desirable and desired throughout life. Dr. Octavia Lewin describes the work of her "nasal hygiene" clinic, and several reviews conclude the 66 pages of this excellent journal.

King's College Hospital Gazette. June, 1921. Vol. I., No. 1.—This is the first number of the Gazette to be published since the war. It will now be issued quarterly at one shilling. In a foreword the editor traces the development of the hospital and medical school since their removal to Denmark Hill in 1913, and more especially since peace was declared. To the first number a historical and critical review of encephalitis lethargica is communicated by Dr. S. A. Kinnier Wilson; Dr. A. C. D. Firth gives a short account of Ambroise Paré as surgeon, and there are several other prose and verse contributions of a literary nature, some serious and others humorous. The present intention of the Editorial Committee responsible for the publication of the Gazette is that it shall contain clinical articles of practical value to students and practitioners, together with literary matter, reviews, and articles dealing with the social life and athletic activities of the hospital.

The Fight Against Disease.—This publication of the Research Defence Society is the quarterly report of the Society's activities, which during the years from 1913 to 1920 was issued only to members and associates, but is now sent to the chief public libraries and may be obtained from any bookseller or agent. A summary is given of Sir John Rose Bradford's address on "The Place of Experiment in the Science and Art of Medicine," delivered at a meeting of the Oxford branch of the Research Defence Society in March: the annual report of the Lister Institute of Preventive Medicine is described in outline, and mention is made of the Dogs Bill talked out on June 3rd on the occasion of its second reading in the House of Commons. The Government report for 1919 on experiments performed on animals during that year is made the basis of a short exposition of the point of view of those who realise the necessity of animal experiments and the care taken to prevent infliction of unnecessary pain during their performance. The names are given of late presidents and vice-presidents, with the striking list of vice-presidents as it stood in 1916. It is hoped in future to publish the report six times a year.

Transactions of the American Association of Genito-Urinary Surgeons. Vol. XIII. 1920. Baltimore: Williams and Wilkins Co. Pp. 280.—In this volume are published the papers read by members of the Association at the Mayo Clinic in 1920, together with the discussions which followed them. The most important item in this publication is a communication from Dr. H. H. Young, explaining his views on the pathology of tuberculosis of the seminal tract, and giving the details of the operation which he prefers to employ for its removal. He considers that the primary focus of genital tuberculosis is in the seminal vesicles, and that from here the disease spreads to the epididymis and elsewhere. The operation which he advises he calls "excision of the tuberculous seminal tract." The vesicles are exposed from the perineum and brought into the wound by the author's prostatic tractor. The diseased vesicle, and perhaps part of the prostate, are thus removed, the vas being divided and a clamp left on its upper end. In the final stage of the operation the epididymis and all that remains of the vas belonging to it are removed through an inguinal incision, the process of removal being helped by to-and-fro traction between the operator and an assistant pulling upon the clamp left in the perineum. Fifteen cases which have been operated upon are here reported, and the results seem good; the paper is very well illustrated. Thirteen other papers are published, one of the most interesting being a description by J. W. Caulk of a method of producing local anæsthesia suitable for operations in cases of obstruction at the neck of the bladder.

Public Health Services.

ANNUAL REPORTS OF MEDICAL OFFICERS OF HEALTH.

County of Norfolk.

Dr. J. T. C. Nash has recently issued his annual report which is chiefly a record for the year 1919, but also embraces features common to 1920. The population of the administrative County of Norfolk at the last Census (1911) was 321,733; the birth-rate for 1919 on the estimated population was 17·3, and the death-rate 14·3. The death-rates of pregnant and parturient women were somewhat in excess in Norfolk during a series of years as compared with England and Wales as a whole, except in the years 1916 and 1917, when they were lower. Dr. Nash considers that this was due in part to the following factors: (1) lack of a sufficient number of qualified midwives; (2) lack of special hospital provision for difficult cases in scattered and sparsely populated villages; (3) inadequacy of some cottages for even a normal confinement; and (4) deficient nutrition of pregnant women.

To deal with the first three factors Dr. Nash suggests that the county council should make arrangements with available hospitals or hostels for the reception of cases for which adequate provision at home is impossible, and should circularise midwives and practitioners as to such provision. One cannot help thinking that if the stigma of the Poor-law was removed, ample accommodation for such cases could be secured in the numerous Poor-law infirmaries in the county, where there is usually a qualified midwife in charge, whose maternity duties are almost entirely restricted to attending at illegitimate births. The fourth factor is largely met now by the Administration of the Milk (Mothers and Children) Order, 1919. The fact that maternal mortality was lower in 1916 and 1917, when income was better and rationing of food was in force, enabling all, even the labouring class, to get a proper share, is suggestive that deficient nutrition is an important factor.

During a series of five years the average infantile mortality for the 12 urban districts (all under 6000 population, except King's Lynn, 20,205) was 90·4, and for the 20 rural districts 81·6. Total average for the county 83·2. These figures, though lower than those of England and Wales as a whole, are too high for a rural area, seeing that the England and Wales figures include all the large towns with conditions which favour a high diarrhœa mortality in years favourable to fly-life and germ-life. Dr. Nash considers that the chief causes of infantile mortality in Norfolk are prematurity and immaturity, which indicates that special attention should be given to ante-natal conditions, especially to the proper nutrition of pregnant women. He lays particular stress upon oral sepsis, associated with carious teeth and anæmia, as conditions inimical to the nutrition of the unborn fœtus, and is convinced that efficient dentistry would be a factor of great value in reducing the death-rate from prematurity. Traditional fallacies as to the feeding of infants are also responsible for a certain number of infant deaths, but recent researches as to the value of the vitamins in food should tend to lessen so-called "deficiency diseases." In 1919 the Norfolk County Council employed three whole-time health visitors, in addition to Miss Fowler (inspector of midwives and supervising county health visitor); 62 midwives and nurses of the Norfolk Nursing Federation were also employed, when possible, as part-time health visitors, at a fixed sum per child visited. During the year 1937 infants under one were followed up by health visitors, out of 4365 live births notified; that is, less than half the number of infants were visited. Dr. Nash advises the appointment of three more whole-time health visitors, to ensure that nearly all the notified births, at least, should be followed up every three or four months. Several infant welfare clinics have been established throughout the county, in both rural and urban districts. In this connexion Dr. H. H. Back, medical officer of health for Aylsham and Blofield Districts, reports: "Doubts have often been expressed as to whether infant welfare clinics could be carried on with advantage in a rural district. The undoubted success of the Blofield clinic will go far to show that under efficient management they can be of great value both directly to those attending them and indirectly through their educational influence."

With reference to infectious diseases, three cases of a mild and unusual type of small-pox occurred in the Loddon Rural District; they were part of an outbreak which more seriously affected the neighbouring districts of East Suffolk; no deaths occurred in Norfolk. Of scarlet fever, 896 cases were notified in the county, with 17 deaths, giving a case-rate mortality of 1·9 per cent., the zymotic death-rate for the county being 0·057. Diphtheria was also in excess; 462 cases were notified, with 47 deaths—a case-rate mortality of 10·17, and a zymotic death-rate of 0·15. Of enteric fever 35 cases were notified, with four deaths, a case-mortality of 11·49 per cent. This comparatively low figure is to be accounted for by the fact that a considerable number of the cases notified were of the "para-typhoid" variety.

There were only five deaths in Norfolk attributable to measles in 1919. This disease has ceased to be notifiable, and Dr. Nash considers that the method of notification through the schools, which has been in vogue in Norfolk since 1908, is much more effective, and still more so is the recent provision of the Ministry of Health of grants in aid of the salaries of health visitors for home visiting and home nursing of cases of measles, and for the provision of hospital or convalescent beds for cases of measles occurring in children under 5 years of age. Whooping-cough accounted for the deaths of 45 children under 5 in 1919. There were 255 deaths from influenza, against 749 deaths in 1918, besides a large increase in deaths from bronchitis, pneumonia, and pulmonary tuberculosis, many of which were, no doubt, attributable to the influenza epidemic of that year. There were four notifications of encephalitis lethargica disease in 1919, one of which was not confirmed in hospital. Dr. Nash states that he ranks himself with Dr. W. H. Hamer and Dr. F. H. Crookshank, of London, in supporting the view that the syndrome encephalitis lethargica is but a manifestation of the protean epidemic disease called influenza, though the more commonly accepted view is that it is a well-defined disease.

With regard to the isolation of infectious diseases the county of Norfolk is at a great disadvantage, from the fact that it possesses no county isolation hospital, a fact which Dr. Nash reported on to the Public Health Committee in December, 1917.

In July, 1919, the County Public Health Committee reported that they had received an offer of a site near East Dereham, which is a very central situation, for the purposes of a county isolation hospital. It was later decided to purchase the site as from October, 1921, so that it is to be hoped that Norfolk will not much longer have to bear the reproach of a lack of accommodation for infectious diseases.

A considerable section of Dr. Nash's report deals with tuberculosis. A comprehensive scheme has now been adopted by the Public Health Committee, which includes as a commencement: (1) The appointment of a tuberculosis officer and resident nurses in defined areas, acting under the supervision of the county medical officer of health; (2) contracts with existing institutions in the county for beds for cases needing institutional treatment; (3) suitable cases, after institutional treatment, to be transferred to the farm colony. The scheme was approved by the Ministry of Health, and Dr. W. B. Christopherson was appointed tuberculosis officer for the county and began duty on August 7th, 1920. A tuberculosis dis-

pensary with laboratory and office accommodation has been provided in Norwich. The farm colony is now in working order. A short account of it was published in THE LANCET of May 21st, p. 1096.

Urban District of Swinton and Pendlebury.

IN many respects the report for 1920 submitted by Dr. W. Stewart Stalker is interesting and satisfactory. The report is valedictory and contains a short review of the districts' health during a period of transition and reform. In 1900 the death-rate for Swinton and Pendlebury was 20·2; to-day it is 12·4. The lives spared have amounted to over 2000. At the beginning of the century 80 infants of every 100 born survived the first year of life; to-day the number is 90. Then, too, 90 persons per 30,000 population contracted typhoid fever against 2 last year. At the corresponding periods 60 and 4 persons respectively died of diarrhœa. A saving of public money has been secured which outweighs by far the expenditure incurred in effecting these improvements. Dr. Stalker is inclined to believe that the older methods of reducing death-rates have nearly attained what within their limit is an irreducible minimum. To reduce death-rates further, what must be aimed at is the pursuit of a higher standard of life on the part of the individual; this higher standard once attained, the slums, the infant mortality, ravages of alcohol and syphilis, and of the unhealthy industry will automatically cease to contribute to a tragic procession toward preventable death. This ideal demands education of the broadest type, and administering authorities possessed of vision and imagination. There are 6680 houses in the district, with 5378 water-closets, but there still remain 1322 privies, and unless some scheme for rapid conversion, regardless of structural conditions, is adopted, privies will be handed on from council to council as a relic of barbarism; problems of economy and expediency have absolutely no claim to consideration in this connexion. A contribution to good legislation would be the exaction of penalties from districts which failed to furnish schemes for the conversion of all privies within a definite period.

There are some interesting and pertinent remarks on the milk question. An American Commission on Milk Standards has recommended classification of milk into three grades according to the number of contained organisms. Grade A milk may have a bacterial content which should not exceed 10,000 organisms per cubic centimetre at time of delivery to the consumer. In grade B milk the number should not exceed 1,000,000. Grade C milk, the lowest grade, is milk in which the number of organisms exceeds 1,000,000 per cubic centimetre at the time of delivery to the consumer. The Commission, moreover, says that whenever any community finds it necessary to allow the sale of grade C milk, its sale should be surrounded by safeguards such as to ensure the restriction of its use to cooking and manufacturing purposes. No sample out of 13 taken in the district of Pendlebury attained the American grade A; 7 were graded B and 6 graded C. Probably the greater portion of milk delivered in towns is grade C milk at the time of consumption. If this contention be true, then it is manifest that unattractive as is the story connected with milk supplies, there is no evidence that there are any grave pathological results. Unfortunately there is overwhelming evidence that a grade A milk inevitably and speedily becomes a grade C milk under the conditions of household storage, which obtain in this district. The vast majority of the organisms found in the milk are perfectly harmless, some are beneficial, and any pathogenic organisms can be rendered harmless by the simple expedient of heat sterilisation.

The staff of the School Medical Service consists of the school medical officer (Dr. Stalker), a part-time clerk, two school nurses, and an ophthalmic surgeon who attends the clinic once a fortnight and prescribes for cases of defective vision. The School Medical Service is still without a dentist. The need is perhaps best demonstrated in the number of young people in the district who are possessed of dentures. The disfigurement is apparent in a journey through the streets when the factories are releasing their operatives. This disfigurement will continue so long as the School Medical Service by education, prevention, and conservation fails to bring about conditions whereby the youth of the district may preserve healthy mouths with natural teeth.

Torquay.

Dr. T. Dunlop's report for 1920 gives the Registrar-General's estimate of the population as 34,703 for death-rate and 35,156 for birth-rate. The death-rate in 1920 was 14·7, compared with an average of 17·5 for the previous five years. The infant mortality rate was 53 compared with 73, and the birth-rate was 18·6 compared with 13. The death-rate from pulmonary tubercle was 1·2 in 1920 and 1·3 in 1919. The general death-rate corrected for age and sex was 12·8. The population of Torquay is, of course, exceptional. The chief occupation of the inhabitants is catering for visitors and villa residents. There is a large excess of females over males, and an unusual proportion of spinsters and females above the child-bearing age. The birth-rate is very low. Before the war births slightly exceeded deaths, from 1915 to 1918 there were more deaths than births. During 1919 there were 27 more births than deaths and during 1920 147 more births than deaths. Of the 34 deaths of infants under 1 year, no less than 16 are attributed to premature birth and congenital defects. In addition 24 stillbirths were registered. As regards "sanitary circumstances," there is a good supply of soft water which does not act on lead. The sewage is discharged into the sea without giving trouble, but attention is drawn to the need for the provision of proper sanitary bins for house refuse. A register is compiled of dairies and cowsheds satisfactory to the sanitary authority situated both within and without the borough. This seems to be a scheme worthy of imitation, as cowsheds outside a borough frequently receive very little attention in the way of inspection from the authority in whose district they are situated. "The question of the provision of an up-to-date abattoir, owing to money stringency and the high cost of building, has been deferred." Dr. Dunlop devotes a good deal of attention to discussing the dirty methods adopted in the transportation of meat and the inadequacy of our powers of inspection of places where food is handled and prepared.

About 45 per cent. of the children born in Torquay are unprotected by vaccination. The Devon County Council is the supervising authority for midwives, whilst the infant welfare scheme is under the town council. This does not seem a satisfactory arrangement for towns of the size of Torquay. Ten cases of ophthalmia neonatorum were notified, and as a result one of these children "has one eye in which there is apparently little vision." In last year's report Dr. Dunlop expressed the opinion that "there was a shortage of about 600 houses for persons of the working classes." The housing committee expect to complete the first 86 during the present summer. In the meantime "there is no doubt that there is overcrowding due to the want of housing and the high rents demanded." There were 1595 hours of bright sunshine recorded and a total rainfall of 33·59 inches.

VITAL STATISTICS OF LONDON DURING JUNE, 1921.

IN the accompanying table will be found summarised statistics relating to sickness and mortality in the City of London and in each of the metropolitan boroughs. With regard to the notified cases of infectious disease it appears that the number of persons reported to be suffering from one or other of the ten diseases notified in the table was equal to an annual rate of 9·4 per 1000 of the population estimated at 4,531,971 persons in the middle of 1920; in the three preceding months the rates had been 9·7, 8·7, and 9·6 per 1000. Among the metropolitan boroughs the lowest rates from these diseases were recorded in

ANALYSIS OF SICKNESS AND MORTALITY STATISTICS IN LONDON DURING JUNE, 1921.

(*Specially compiled for* THE LANCET.)

CITIES AND BOROUGHS.	Estimated civil population, 1920.	Notified Cases of Infectious Disease.											Deaths from Principal Infectious Diseases.								Deaths from all causes.	Death-rate per 1000 living.
		Enteric fever.	Other continued fevers.	Small-pox.	Scarlet fever.	Diphtheria.*	Erysipelas.	Poliomyelitis and polioencephalitis.	Encephalitis lethargica.	Cerebro-spinal fever.	Puerperal fever.	Total.	Annual rate per 1000 persons living.	Enteric fever.	Small-pox.	Measles.	Scarlet fever.	Whooping-cough.	Diphtheria.*	Diarrhœa and enteritis (under 2 years).	Total.	Annual rate per 1000 persons living.		
LONDON	4,531,971	36	2	—	2620	1215	197	4	10	5	19	4068	9·4	6	—	18	33	37	63	52	209	0·5	4082	9·4
West:																								
Paddington	149,673	1	—	—	80	27	8	—	—	—	—	116	8·1	—	—	—	—	2	1	4	7	0·5	94	6·5
Kensington	164,177	3	—	—	53	29	7	—	—	—	2	94	6·0	—	—	—	2	2	2	1	7	0·4	169	10·7
Hammersmith	136,200	2	1	—	161	35	5	—	—	—	2	206	15·8	1	—	—	3	1	3	3	11	0·8	123	9·4
Fulham	158,621	—	—	—	75	59	6	—	—	—	—	140	9·2	—	—	—	1	2	6	1	10	0·7	146	9·6
Chelsea	62,987	—	—	—	24	6	3	—	—	—	—	33	8·5	—	—	—	—	—	—	1	1	0·2	44	7·3
City of Westmin'r	132,615	1	1	—	48	14	6	—	—	—	2	72	5·7	—	—	—	—	2	—	2	4	0·3	114	9·0
North:																								
St. Marylebone	101,856	3	—	—	46	15	5	—	1	1	—	71	7·3	1	—	—	—	—	1	—	2	0·2	109	11·2
Hampstead	91,519	1	—	—	35	21	1	—	1	—	—	59	6·7	—	—	—	—	1	—	1	2	0·2	73	8·3
St. Pancras	228,178	3	—	—	113	57	6	1	—	—	2	182	8·3	—	—	—	1	2	6	1	5	0·6	204	9·3
Islington	335,907	1	—	—	168	97	10	1	—	2	2	281	8·7	—	—	—	2	1	3	3	4	0·4	293	9·1
Stoke Newington	52,984	—	—	—	36	5	—	—	—	—	1	42	8·3	—	—	—	—	—	—	—	—	—	48	9·4
Hackney	225,372	1	—	—	155	109	3	—	1	—	—	269	12·4	—	—	—	1	—	2	5	2	10	0·5	187	8·7
Central:																								
Holborn	39,676	1	—	—	6	18	2	—	—	—	—	27	7·1	—	—	—	1	—	1	1	3	0·8	48	12·6
Finsbury	78,291	—	—	—	35	34	3	1	—	—	1	75	10·0	—	—	—	1	1	5	1	8	1·1	90	12·0
City of London	14,447	—	—	—	18	8	—	—	—	—	—	26	18·8	—	—	—	—	—	—	—	—	—	11	7·9
East:																								
Shoreditch	102,044	1	—	—	106	48	5	—	—	—	1	161	16·5	—	—	1	2	—	2	2	7	0·7	98	10·0
Bethnal Green	114,471	—	—	—	61	50	5	—	—	—	—	116	10·6	—	—	1	1	1	—	3	6	0·5	100	9·1
Stepney	241,770	3	—	—	188	74	7	—	—	—	—	272	11·7	—	—	6	2	1	3	1	13	0·6	227	9·8
Poplar	159,766	1	—	—	117	41	5	—	—	1	2	167	10·9	1	—	—	6	1	3	3	14	0·9	158	10·3
South:																								
Southwark	187,142	1	—	—	105	42	14	—	1	—	—	163	9·1	1	—	—	1	4	2	4	12	0·7	216	12·0
Bermondsey	129,189	2	—	—	105	35	4	—	—	—	—	146	11·8	1	—	—	1	—	1	—	3	0·2	109	8·8
Lambeth	293,572	—	—	—	158	59	9	—	2	1	—	229	8·1	—	—	2	2	—	1	3	8	0·3	271	9·6
Battersea	165,664	2	—	—	77	51	8	—	—	—	2	140	8·8	—	—	—	2	—	8	6	16	1·0	163	10·3
Wandsworth	346,990	3	—	—	109	89	8	1	2	—	—	212	6·4	—	—	1	3	2	5	3	14	0·4	288	8·7
Camberwell	284,712	3	—	—	114	58	11	—	—	—	2	188	6·9	—	—	2	1	2	7	1	13	0·5	261	9·6
Deptford	115,636	1	—	—	76	25	6	—	—	—	—	108	9·7	1	—	—	1	1	1	2	6	0·5	101	9·1
Greenwich	102,408	—	—	—	90	24	5	—	—	—	—	119	12·1	—	—	—	—	—	1	—	1	0·1	83	8·5
Lewisham	174,438	1	—	—	98	35	4	—	1	—	—	139	8·3	—	—	—	—	2	1	—	3	0·2	147	8·8
Woolwich	141,666	1	—	—	163	50	1	—	—	—	—	215	15·8	—	—	1	—	1	—	—	2	0·1	107	7·9

* Including membranous croup.

Kensington, Chelsea, the City of Westminster, Hampstead, Wandsworth, and Camberwell; and the highest in Hammersmith, Hackney, the City of London, Shoreditch, Greenwich, and Woolwich. The prevalence of enteric fever was somewhat greater than in the preceding month; of the 36 cases notified during the five weeks ended July 2nd 3 cases belonged to each of the boroughs of Kensington, St. Marylebone, St. Pancras, Stepney, Wandsworth, and Camberwell. There were 23 cases of enteric fever under treatment in the Metropolitan Asylums Hospitals at the end of the month, against 10, 10, and 18, at the end of the three preceding months; the weekly admissions averaged 4, against 3, 2, and 5 in the three preceding months. The prevalence of scarlet fever was about equal to that in the preceding month; this disease was proportionally most prevalent in Hammersmith, the City of London, Shoreditch, Stepney, Bermondsey, Greenwich, and Woolwich. The Metropolitan Asylums Hospitals contained 3621 scarlet fever patients at the end of the month, against 3487, 3217, and 3375 at the end of the three preceding months; the weekly admissions averaged 506, against 469, 411, and 507 in the three preceding months. The prevalence of diphtheria was also about equal to that in May; the greatest proportional prevalence of this disease was recorded in Hackney, Holborn, Finsbury, the City of London, Shoreditch, and Bethnal Green, a group of adjoining areas. The number of diphtheria patients under treatment in the Metropolitan Asylums Hospitals, which had been 2652, 2429, and 2121 at the end of the three preceding months, further fell to 1896 at the end of June; the weekly admissions averaged 235, against 290, 261, and 241 in the three preceding months. Erysipelas was proportionally most prevalent in Paddington, St. Marylebone, Holborn, Shoreditch, Southwark, Battersea, Deptford, and Greenwich. Ten cases of encephalitis lethargica were notified during the month, against 77, 56, 24, 14, and 18 in the five preceding months; of these, 2 belonged to Lambeth and 2 to Wandsworth. The notified cases of cerebro-spinal fever numbered 5, against 14, 12, and 11 in the three preceding months; of these, 2 belonged to Islington. Nineteen cases of puerperal fever were notified during the month, against 33, 30, and 32 in the three preceding months. The mortality statistics in the table relate to the deaths of civilians actually belonging to the several boroughs, the deaths occurring in institutions having been distributed among the boroughs in which the deceased persons had previously resided. During the five weeks ended July 2nd the deaths of 4082 London residents were registered, equal to an annual rate of 9·4 per 1000; in the three preceding months the rates had been 13·6, 12·6, and 11·2 per 1000. The death-rates ranged from 6·5 in Paddington, 7·3 in Chelsea, 7·9 in the City of London and in Woolwich, 8·3 in Hampstead, and 8·5 in Greenwich, to 10·7 in Kensington, 11·2 in St. Marylebone, 12·0 in Finsbury and in Southwark, and 12·6 in Holborn. The 4082 deaths from all causes included 209, which were referred to the principal infectious diseases; of these 6 resulted from enteric fever, 18 from measles, 33 from scarlet fever, 37 from whooping-cough, 63 from diphtheria, and 52 from diarrhœa and enteritis among children under 2 years of age. No death from any of these diseases was recorded in Stoke Newington or in the City of London. Among the metropolitan boroughs the lowest death-rates from these diseases were recorded in Chelsea, St. Marylebone, Hampstead, Bermondsey, Greenwich, Lewisham, and Woolwich; and the highest in Hammersmith, Holborn, Finsbury, Poplar, and Battersea. The 6 fatal cases of enteric fever were one fewer than the average in the corresponding period of the five preceding years. The 18 deaths from measles were less than one-sixth of the average; of these, 6 belonged to Stepney, 2 to Islington, 2 to Lambeth, and 2 to Camberwell. The 33 fatal cases of scarlet fever exceeded the average by 25; of these, 6 belonged to Poplar, 3 to Hammersmith, and 3 to Wandsworth. The 37 deaths from whooping-cough showed a decline of 27 from the average; of these, 6 belonged to St. Pancras, 4 to Southwark, and 3 to Islington. The 63 fatal cases of diphtheria were 16 in excess of the average; the greatest proportional mortality from this disease occurred in Fulham, Finsbury, Battersea, and Camberwell. The 52 deaths from infantile diarrhœa were 9 below the average; of these, 6 belonged to Battersea, and 4 to each of the boroughs of Paddington, Islington, and Southwark. In conclusion, it may be stated that the aggregate mortality in London during June from these principal infectious diseases was 31·7 per cent. below the average in the corresponding period of the five preceding years.

THE LANCET.

LONDON: SATURDAY, JULY 30, 1921.

The Bearings of the Staff Fund.

A COLOSSAL effort is being made to save what is known as the voluntary hospital system in this country. The Cave Committee, reporting on May 31st, said: "Is the voluntary system worth saving? We are convinced that it is." Writing to Lord SOMERLEYTON, hon. sec. of King Edward's Fund for London, on July 12th, the Prince of WALES spoke of the injury to the welfare of the sick and the enormous expense to the State which would follow if the voluntary hospital system fell to the ground. And on July 18th the annual business meeting at Newcastle of the British Medical Association affirmed with practical unanimity its belief that the voluntary method of administration is to the advantage alike of the public, medical science, and the medical profession, and should be maintained. Now such distinguished and congruous support should be sufficient to ensure the success of any system, were its principle accurately defined or indeed capable of exact definition. Probably all or nearly all of us would like to see the hospitals of the country run on the generous lines and easy finance of the first decade of the present century. Those times, alas, are gone; most honest people would add, never to return. And therefore, to be quite frank, we cannot maintain the voluntary hospital system, in which most of us have been brought up, unmodified, with all its splendid ideals and occasional defaults. And it may be useful to inquire exactly what is the essential part or principle of the system which is to be saved; to demand in fact an exact definition from those who use the term what it is of which they are speaking or thinking.

Unanimity disappears at once when we do this. A piquant contrast was afforded by the views of the first two speakers at the Newcastle meeting. Dr. F. REES, representing West Cornwall, said that anyone could see, if he chose to see, that the voluntary system was no longer capable of efficiently meeting the situation; half a million pounds of public money had just been voted by Parliament for the support of hospitals. That was the epitaph of the system. Dr. S. NOY SCOTT, representing the neighbouring constituency of Plymouth, declared that rather than have hospitals handed over to the control of the State he would see many of them closed until such time as voluntary subscriptions enabled them to be reopened. And later in the debate the B.M.A. Representative Meeting, on the invitation of its Council, differed with emphasis from the Cave Committee on one principle, that of honorary medical service, which has hitherto been regarded as a fundamental point in the system. Paragraph 50 of the Cave Report, which we print in full on p. 246, refers to the practice obtaining in some hospitals of carrying a proportion of any grants from public authorities to a fund placed at the absolute disposal of the honorary medical staff. If this practice is confined to cases where the full cost of maintenance and treatment is paid by or on behalf of the patient, not much objection, the Cave Committee thinks, can be taken to it; but any extension of the practice beyond those limits appeared to the Committee to endanger the future of voluntary hospitals. The B.M.A. proposes to extend the practice greatly beyond those limits, maintaining that the essence of the voluntary hospital system is the independent and voluntary management, this being in no way related (these four words are quoted literatim) to the conditions of service of the medical staff. As an illustration it was pointed out that the B.M.A. remains a voluntary association, although its staff is salaried. The staff fund, it might be argued, being at the absolute disposal of the staff, might be returned by them to the maintenance account, wherever this might seem equitable; in practice, however, hospital officers, like Members of Parliament, would find it invidious to return their salaries.

Here is a discrepancy which requires to be faced in order to be cleared up. We have no doubt that there are many members of the medical staffs of general hospitals who regard their honorary position as entitling them to speak with freedom and independence for the nature of the control to which they submit, and voluntary hospital committees are regarded as more prompt to act in the interests of medical education and research than committees which administer public money. No doubt the honorary staff are aware, in the words of the Cave Report, that they obtain a valuable return in the form of medical and surgical experience and the enhanced reputation which accrues to a member of the visiting staff of a great hospital. But we believe that many of them would hesitate to take the suggested tithe from patients who contribute individually or collectively to their maintenance, unless that contribution exceeds the cost of maintenance, and includes a quota for treatment. This feeling, which may or may not be well founded, rests on the tacit acceptance of the right on the part of those who pay the doctor to call the tune, and the distrust by the medical man of any sort of bureaucratic control. This has been the position in the past. The new definition, if accepted by the public, would enable the medical man to draw his income directly from his hospital work without admitting the interference or coöperation, whichever is the term preferred, of representatives of county or district councils, labour committees, Approved Societies, the Ministry of Health, or what not other trustees of funds. But will the public acquiesce in the new definition? It might be well to find out. If the professional view should prove untenable—and it would be prudent to consider the possibility of this—then, or even earlier, it might not be amiss for a few enterprising voluntary hospital committees to admit to their board certain of these representatives, and to test their ability to act in the same whole-hearted way for the public weal as their colleagues.

Professional Secrecy.

ON the first day of the Annual Representative Meeting of the British Medical Association the important subject of the preservation of professional secrecy in the witness-box was discussed at length, and the proceedings were reported in our columns last week. The subject is of such profound public and medical interest that we return to its discussion at greater length. The result of the debate of Representatives was that a recommendation of the Council on the subject failed to secure support, an amendment

being substituted for it, which entirely contradicted its essential purpose, but as sufficient notice of this amendment had not been given it could not be immediately adopted as the policy of the Association, but must be regarded as a strong expression of the opinion of the Representatives. The original recommendation was to the effect that the Association could not protect a medical man from the consequences of refusing to divulge information obtained professionally (1) in a court of law where the court has ruled that information so obtained must be divulged, (2) when it is provided by an Act of Parliament that he must do so, as in the case of notification of disease. In other words, any refusal to divulge at a trial professional confidences must be at the risk of the individual practitioner. The resolution further stated that resistance would be given by the Association to any "further encroachments" on professional secrecy. The amendment, which was moved by Dr. H. G. DAIN, recommended "that the Association use all its power to support a member who refuses to divulge, without the patient's consent, information obtained in the course of his professional duties," to which was afterwards added the sentence "except where it is already provided by Act of Parliament that he must do so." Thus as to obedience to statements to be made in accordance with a statute agreement seems to have been arrived at, subject to the observation that the nature of the encroachments to be resisted in the future is left obscure. Notifications under Acts of Parliament are a form of revelation of professionally acquired knowledge, which are usually introduced on public grounds and in the interest of preventive measures against disease. They are also frequently the result of the advice of the medical profession, or of an important section of it.

As to the main issue debated at the meeting, the giving of medical evidence without the consent of the patient concerned on the order of the judge, it will be difficult to support unreservedly and logically either the Council's original recommendation or the amendment provisionally adopted; each is of too general a character. The Council's recommendation denies support in any case of resistance to any judicial decision of the kind indicated, whatever the nature of the trial in question, and whatever may be the means by which the required information has been obtained by the medical man. The discussion was induced by a recent judicial decision to the effect that knowledge acquired in a clinic for venereal disease might be ordered to be published in a court of law. Now the fact that the particular patient had no objection to the doctor giving evidence does not affect the principle involved, for the judge could know nothing about the patient's wishes. A judge's ruling is a common factor in all cases where the witness is unwilling to testify. One way, at any rate, of meeting such a ruling is a test case. The Council's recommendation appears to be that all judges' rulings must be acquiesced in without resistance, and this we hold to be a wrong view. But Dr. DAIN's amendment may prove too sweeping to be practicable in operation, and we are strengthened rather than shaken in our opinion by some of the arguments used in its support. Dr. DAIN treated his amendment as embodying the ascertained views of the public, who would support the proposition that the doctor should never tell what his patient told him, including, we presume, such important matters of fact as he has observed for himself. He made reference especially to civil cases, but his amendment would cover both civil and criminal trials. As to this we point out that in the trial of crime a doctor's evidence withheld might conceivably lead to the escape of a criminal from the consequences of his crime, or the conviction of an innocent man for a crime which he never committed. To give examples of what the doctor's silence might involve in civil causes, it might constitute him as a silent abettor in a fraud attempted on a life assurance company, in a case of the wrongful substitution of an infant, or in the effort of a guilty husband or wife to deceive the divorce court. We do not multiply instances of the kind of trial in which the medical man may be asked to give evidence as to a patient without the patient's consent. It is enough to say that they are rare compared with the innumerable other occasions when medical evidence is sought. They are, however, often of importance when they do occur, and it is difficult to assent to the proposition that the public, or any section of it whose opinion would carry weight, would view with satisfaction the miscarriage of justice rather than see the medical profession assist in its due administration. The arguments founded on the privilege of solicitors lose sight of the fact that with the withdrawal of the privilege the administration of justice could hardly be carried on. A supposed privilege of priests was also invoked by a speaker on Dr. DAIN's amendment. We are aware of no right or power of the clergy of any denomination to refuse to give evidence when ordered to do so by the court. An account given by Dr. R. J. ROWLETTE at the meeting of the refusal of certain hospitals to give information to the military authorities in Ireland had no bearing that we can see on the question of resisting the order of a judge in the actual course of a trial. We should be the last to support any effort to convert medical men into detectives of crime. In contact with a suspected criminal a doctor may have a duty as a citizen to consider, but his wisest course will be to confine his attention to his patient's physical needs, and to divert it as far as possible from everything else concerning him. It is well not to prejudice the case for professional secrecy by overstating it, or by asking too much.

The refusal, however, of the Council of the British Medical Association to countenance or support any idea of resistance to judicial authority in any circumstances, and the amendment which advises support to all such resistance, appear alike inadequate to meet the new conditions which have arisen. These are the outcome of Mr. Justice HORRIDGE's decision as to information acquired at a venereal clinic, coupled with that of Lord MERSEY in another divorce case with regard to records in the custody of a medical officer of health. The possible use in personal litigation of medical history cards, compiled under the Insurance Act, has also to be considered. Both the Council's recommendation and that contained in the amendment appear to contemplate the possibility of test cases, undertaken with the support of the British Medical Association, or with that of the profession generally, in order to ascertain the exact position of the medical witness in certain circumstances with a view to future action. The one, however, refuses the consideration of any test case, and the other proposes to make a test case out of any refusal to give evidence. It is suggested that the better course would be to reserve a discretion to give all support possible in a case in which the principle involved might deserve the support of the profession at large, and of that section of the public whose opinion carries weight. The case of the venereal clinic is a good example of our meaning. The idea that anything passing within the walls of the clinic would be secret was promoted and fostered by the medical profession and by laymen alike on grounds

of public policy. If the steps taken by a public department to procure such secrecy are insufficient without the sanction of an Act of Parliament, the legislature should intervene. By a test case we mean one in which there might be a strong combined protest on the part of the medical profession in which representative members of the public could join. At present it appears that the judge exercises a discretion against which there is no appeal and as to which there is no consistent judicial practice. It is not known, for example, how far Mr. Justice HORRIDGE would have the approval of his brother judges in the case referred to, or what the attitude of informed laymen generally may be. What is needed is certainty in order that proper constitutional action may be taken. Such, in broad outline, are the considerations which we commend to the Council of the British Medical Association in the time that remains to it before it decides to confirm as the policy of the Association the downright attitude taken up by the Representative Body—much depends upon its wise statesmanship.

Infant Mortality and the Practitioner.

IT is sometimes contended that no popular movement ever succeeds quickly and uniformly throughout a country unless the people are already uneasily groping for a lead which is overdue. Enthusiastic leaders, however, usually claim that the public awakening is not only coincident with but actually due to the crusade, and that any slackening of effort in propaganda will lead to a reversion to former indolence. The gratification caused to the zealous by the conviction that they have actually achieved a reform is a powerful stimulant to further effort; voluntary workers especially tend to regard themselves as a driving force, and would derive little satisfaction from the humbler conception of their office as that of planning the railroad on which the engine of progress can most advantageously travel. In such an important national question as that of infant mortality, however, it is surely not unprofitable to try to estimate what factor or factors have contributed to the gratifying national reduction reported by Sir GEORGE NEWMAN for 1920 in order that no effort should be wasted or misdirected. The Medico-Sociological Committee of the British Medical Association, appointed in October, 1920, chose the value of Maternity and Child Welfare Work in Relation to the Reduction of Infant Mortality as the first subject for consideration, and it is a happy coincidence that their report[1] should have been issued at a time when conferences on infant welfare, such as those held in London,[2] Brussels, and the one announced for Vienna, are claiming public attention. The Committee coöpted well-tried representatives of general public health activities and of special branches of the work under discussion to aid them in their arduous task, and a questionnaire was circulated, to which most of the answers were supplied verbally. We print on p. 248 the summarised recommendations of this Committee. The proper estimation of the influence exercised by maternity and child welfare work apart from that of other health agencies taxed its acumen. For example, one London district, the poorest and most thickly populated in the area, showed the greatest improvement in the infant mortality rate, and it was in this district that centres had been established earliest and most actively developed; again, certain other figures seemed to show that the curves of infant mortality follow practically the same course in towns where centres are active as in those where they are not. However, after considering the evidence laid before them the Committee record their opinion that "maternity and child welfare work has contributed to an appreciable extent to the reduction of infant mortality that has taken place, but . . . it is too early yet to determine what that extent has been."

Among the many tables set forth in the annual report just issued by the Chief Medical Officer of the Ministry of Health, the most arresting are certainly those showing the infant mortality rate for England and Wales since 1881. The highest figure is 156, for the five years 1896-1900, and the lowest is 80, for 1920. In 1919 the figure was 89; in 1916, the next lowest year, 91. An interesting drop from 130 in 1911 to 95 in 1912 is followed by a rise to 108 in 1913, and the average of the two subsequent years remains at this figure. Analysis of this and other tables shows that the incidence of infant mortality is heaviest in the first three months of life, especially in the first week, and that various social, domestic, and industrial conditions, notably illegitimacy, influence the infantile death-rate. Sir GEORGE NEWMAN classifies the three chief causes of death as developmental conditions, respiratory disease, and diarrhœal disease. The decrease in infant mortality recorded in recent years is referable mainly to fewer deaths from diarrhœa, partially to deaths from respiratory diseases, and, to a much less degree, from developmental conditions. Sir GEORGE NEWMAN interprets the fact that about 30 to 35 per cent. of infantile deaths are due to developmental and 40 to 45 per cent. to infective conditions as meaning that approximately half of the infant death-roll is directly preventable. In this connexion Dr. W. A. BREND's deductions from a statistical review presented to the Medical Research Council in 1917, supported by the recent investigations of Prof. ARTHUR ROBINSON,[3] are of interest. Dr. Brend considers that there is a non-preventable infant mortality of from 25 to 30 per 1000, and that these deaths, due to antenatal biological causes, occur almost entirely in the first month after birth. Undue insistence on some estimated figure as a minimum below which infant mortality could hardly be reduced would be unwise. It should be noted, however, that the attention being directed in various parts of the country to post-mortem histological examination of the tissues of stillborn fœtuses may not yield such clear results as was at one time hoped; and Prof. ROBINSON's suggestion that many deaths in utero may be attributable to biological rather than to pathological causes may well influence the lines into which research may profitably be directed in the future. But the child stillborn for lack of antenatal care, of skill in delivery, or of convenient surroundings during labour is a disgrace which calls for remedy. We hope that the schemes of the Ministry of Health for the provision of maternity hospitals and homes for normal confinements, outlined by Dr. JANET CAMPBELL in our issue of July 16th, will be prosecuted with vigour. Those who have worked as medical officers of antenatal clinics, without residential provision, did not perhaps feel the need of such provision when the centres were first opened. The mothers had to be coaxed thither with the utmost tact, and any suggestion that a residential institution could be a more fitting place

[1] Price 3*d*., from the British Medical Association, 429, Strand, London, W.C. 2.

[2] THE LANCET, July 16th, 1921, p. 148.

[3] THE LANCET, May 14th, 1921, p. 1030.

for the birth of a child than the parental home, however squalid, would have been resented. It is difficult to say whether a change of attitude is due to the house shortage or to appreciation of the fact that labour is more likely to be a simple physiological act if it is carried on in a surgically clean environment; but it is certain that more and more mothers are showing avidity to place themselves in a home, and have to be discouraged for lack of accommodation.

There is still some prejudice among general practitioners against the infant and antenatal welfare centres. The Representative Body of the British Medical Association rejected its Committee's report under circumstances which we detail elsewhere; but this prejudice is dying a natural death now that the objects of these centres are avowedly becoming educational, advisory, and preventive rather than curative or philanthropic. No one will deny that a severe test of the existing machinery for preserving the health of infants is the present hot weather, especially since it coincides with a depreciation of the standard of living following on trade depression. The instructions issued by the Ministry of Health last week (THE LANCET, July 23rd, p. 206), on the adaptation of child welfare organisation to prophylaxis and treatment in the case of a threatened epidemic of infantile diarrhœa, are timely, and if no marked increase in infant mortality in 1921 follows on this most unusual spell of hot weather, it will be to some extent because the mothers have, owing chiefly to the welfare centres, become more learned in the art of nurture. On this one point we venture to dogmatise.

THE COMPOSITION OF THE URINE DURING HUNGER.

MANY investigations have been made on the composition of the urine during hunger, but perhaps the most complete is that one carried out on two of their countrymen by Dr. N. Suzuki and Dr. N. Hasui,[1] of Kyoto. One of the subjects fasted 21·5 days and the other 14 days. A complete analysis of the urine was made daily during the hunger period, and the results compared with those obtained immediately before and after this period. Other clinical observations were also made, and the following summary represents the chief results obtained. The body weight in both cases fell very rapidly during the first six hunger days; in the second week more slowly and somewhat irregularly, and in the third week (1 case) the fall was slight and fairly regular. After resumption of feeding the increase in weight during seven days in one case was 4·1 kg., and in the other 4·15 kg. With the exception of a feeling of hunger and slight vertigo, during the whole hunger period there were no troubles complained of. The most marked decrease in the circumference of the body occurred around the level of the umbilicus, especially in the first week. The pulse beat, body temperature, and number of respirations fell, but rose again a few days after taking food. A fall of blood pressure was first observable after two weeks, and the normal pressure was restored within a week of the end of the starvation period. The tendon reflexes during the first week were normal or increased, and then became gradually weaker. In both cases the patellar reflex had noticeably decreased on the fifteenth day, and the Achilles tendon reflex had disappeared. Both gradually returned with the taking of food.

As to the urine itself, the total nitrogen in both cases from 2–6 days was just over 10 g., and gradually fell with the hunger period. The maximum, in one case (0·25 g.) and in the other (0·37 g.) per kilo of body-weight, was reached on the fourth day. At the beginning of the after-hunger period the nitrogen excretion fell distinctly, rose steeply from the fifth day, and in one case reached normal on the seventh day. The excretion of ammonia-nitrogen showed a quite regular curve. From the second day to the fifth or eighth day there was a steady rise, and then a progressive fall to the end of the experiment. After food had been taken for a week the normal value was restored. The excretion of urea in both cases ran parallel with the total nitrogen output. The amino-acid excretion showed a gradual fall till the end of the experiment. In the food period in both cases there was a sudden rise in the excretion (the food from the fifth day onwards contained albumin). The variations of uric acid are quite different from those of the total nitrogen. In one case it diminished from the first to the third day, and then rose until the end; in the second case the maximum (0·107 g.) was reached on the fifth day, and the excretion then fell to a minimum of 0·06 g. at the end of the experiment. There was a sudden rise when food was resumed. There was no marked variation in the amount of the purin-bases nitrogen. The purins in the food seem to be almost entirely excreted as uric acid in the urine. The kreatinin at first showed a fall, then a rise, followed by a fall. Kreatin was present in small amount on the first day, then it increased and remained between 0·08 and 0·11 g. On the second day, after food was taken, it fell abruptly. The fall of chlorine was very regular from the fifth to the last day of starvation, and the normal was restored on the fifth to the sixth day after the fast had been broken. The relation of the amount of chlorine to the freezing point rose gradually with the progressive hunger, while that of the total nitrogen to the freezing point showed no marked variations during the whole hunger period. The amount of phosphorus fell on the first day; from the second day it rose, and reached a maximum on the fourth; from the fifth day it gradually fell, and fell even more in the after-period, owing to the retention of compounds of phosphorus. The total sulphur fell on the first day; then followed a steady increase to the fourth or fifth day, and then a fall. On the resumption of food there was a second considerable fall in the sulphur excreted; but it rose with a diet rich in protein. The secretion of inorganic sulphates ran parallel to that of the total sulphur. The ethereal sulphates fell distinctly on the first or second day, rose on the second or third day, and then steadily fell until food was taken, when the amount gradually rose again. The neutral sulphur showed no obvious variation during hunger or the after-period. Acetone appeared on the first day and aceto-acetic acid on the second. Phenol excretion fell on the first three days; from the fourth to the seventh days the value was nearly normal. Cystin (1·0–2·0 g.) taken during the hunger period was totally oxidised and excreted in the urine as inorganic sulphate. Tyrosin given by the mouth caused on the day of its introduction in pre- and post-hunger period a distinct increase in the excretion of phenol, while if given during the hunger period the increase was first noted on the second following day. Phenylacetic acid introduced subcutaneously was excreted partly as phenylacetylglutamin and partly as phenylacetylglutaminurea; the amount of both in the pre-hunger period being about equal. In the hunger period the amount of the latter was about double that of the former.

[1] Acta Scholæ Medicinalis Universitatis Imperialis in Kioto, vol. iv., 1921.

INDEX TO "THE LANCET," VOL. I., 1921.

THE Index and Title-page to Vol. I., 1921, which was completed with the issue of June 25th, is now ready. A copy will be sent gratis to subscribers on receipt of a post-card addressed to the Manager of THE LANCET, 1 and 2, Bedford-street, Strand, W.C.2.

Annotations.

"Ne quid nimis."

FRENCH SENATE AND TEMPERANCE LEGISLATION.

THE proposal last week in Parliament to suspend the activities of our Liquor Control Board leads to an instructive comparison with the very different conditions ruling on the other side of the Channel. A frequent correspondent writes: The French Senate has refused to confirm the proposal accepted by the Chamber of Deputies to reduce the tax on wine. This involves an important social question which should be of special interest to the advocates of temperance. Of course, there is no reckoning with the contradictions or inconsistencies that may result from the financial stress due to the war; but, in its present decision, the Senate has acted against tradition and expectation, and against what some consider wise policy. When, some 40 years ago, the vineyards of France and Switzerland were devastated by the phylloxera, the increase of drunkenness, insanity, and crime was so marked that the Senate appointed a special commission to inquire into the cause of this evil. We explained at the time, and on several subsequent occasions,[1] the conclusions arrived at by the Commission, which were endorsed by many Congresses of Hygiene and similar scientific gatherings, both national and international. It was generally agreed that the evils of drunkenness were almost unknown in those countries where natural wines were plentiful and cheap, for the desire and need for drinking spirits did not arise. It was because this happy condition was destroyed by the phylloxera that a rapid increase of intemperance and its attendant evils caused the Senate to take action. The vineyards were saved by grafting French vines on American roots. Grapes became abundant again, real and cheap wines took the place of imitations made with dried currants, bad alcohols, and other unwholesome ingredients, and drunkenness abated. This wholesale object-lesson gave rise to a widespread view that if populations were contented to drink clean water and light and pure wine and beer, the demand for strong spirits would die down, and there would be little drunkenness. Cider, perry, and hydromel are accepted also by the French definition as hygienic drinks. Light wines are, of course, the strongest, for they may contain as much as 12 or 13 per cent. per volume of alcohol. But then if drunk in large quantities, as for instance, in very hot weather, they are generally mixed with at least half as much again of water. In course of time practical action followed theoretical discussion, and a law was enacted by which towns and communes were allowed local option in carrying out temperance legislation. Paris led the way by a heroic resolution to abolish altogether every tax on hygienic drinks. In 1897 the municipal income of Paris amounted to £6,200,000. The abolition of the tax (octroi duty) on hygienic drinks would have reduced these receipts to £4,400,000. Nevertheless, Paris was so determined to do away with drunkenness and the disease of alcoholism, that it consented to lose this source of revenue, thus sacrificing more than £2,000,000 annually. The results were satisfactory. In good vintage years wholesome natural wines could be purchased retail and within the walls of Paris at from 1½*d.* to 2*d.* the pint, or 15 to 30 centimes the litre. So there was no excuse for drinking spirits.

The war shattered all these temperance measures. Wine became dear, and taxes had to be re-imposed. In the course of time, however, the Chamber of Deputies thought it might venture on a small and first step towards restoring the former position, which had conduced to temperance. A Bill was recently introduced and adopted by the Chamber of Deputies to reduce the taxes that had been re-enforced upon hygienic drinks. Thus the tax on wine was to be reduced from 19 fr. to 12 fr. per hectolitre: on cider from 9 fr. to 6 fr., and on beer from 2 fr. 60 c. to 1 fr. 65 c. per hectolitre. But in the Senate it was objected that this would mean a loss of revenue of 461,000,000 fr. for the State and 51,000,000 fr. for the communes. Though the Senate had in former days been the means of initiating such measures in favour of hygienic drinks, it now declared that, temperance or no temperance, neither the State nor the local authorities could afford these financial sacrifices. Thus the Senate on July 9th threw out the Bill, but only by a majority of 155 votes against 136. We may, therefore, anticipate that the matter will come up again at no very distant date. In the meanwhile, it is very desirable that further reliable informations and statistics should be forthcoming. All countries will be interested to know to what extent the more recent increase in the cost of wine has produced results similar to what was noticed when the phylloxera destroyed the vineyards.

[1] See "Temperance Legislation in France," a series of articles commenced in THE LANCET on March 10th, 1906.

SYPHILITIC BACKACHE.

BACKACHE when it occurs in syphilitic infection is apt to be persistent and intractable. Dr. Joseph Victor Klauder,[1] assistant professor of dermatology and syphilology at the Graduate School of the University of Pennsylvania, who records four illustrative cases, discusses the nature of syphilitic backache according as it is a symptom of specific involvement of the spinal cord, lumbar muscles, or vertebræ. In most instances it is a symptom of involvement of the spinal cord, the condition being meningeal in origin and due to irritation of the posterior sensory roots. The posterior surface of the cord is more frequently involved than the anterior surface, and the meningitis is more extensive and more intense in this region. It is usually most severe in the dorsal segment, where the spinal cord offers least resistance. Syphilitic spinal meningitis may be acute, subacute, or chronic, and may persist from the early secondary period until many years later. In addition to backache, other sensory symptoms of meningitis may be present, such as girdle-pain, hyperæsthesia, and paræsthesia. The tendon and skin reflexes are increased. Motor irritation is manifested by tension in the muscles. Clinically there is rigidity of the back combined with localised or diffuse tenderness on percussion of the vertebral column. The spinal fluid always shows a positive Wassermann reaction and a more or less marked pleocytosis according to the severity of the meningeal involvement. In backache due to syphilis of the lumbar muscles the underlying condition is rather an acute spirochætal infection than a syphilitic myositis, which chiefly affects the flexors of the arms and legs. Backache due to syphilis of the vertebræ is rare, the cervical region being most frequently affected. Of 55 cases collected by Neumann in 1904, the cervical region was affected in 65 per cent., and the dorsal and lumbar region in 31 per cent. In syphilis, in contrast with tuberculosis, the spinous and transverse processes are more apt to be affected than the bodies of the vertebræ. The pathological conditions are periostitis and osteitis, which may lead to necrosis and the production of sequestra. There is less likelihood of the formation of a cord abscess than in tuberculosis of the vertebræ. Syphilis, however, as in one of Dr. Klauder's cases, may rouse dormant tuberculosis into activity, so that this possibility should be borne in mind in the presence of vertebral involvement in a syphilitic patient. Synovitis of the spinal joints, which Dr. Klauder regards as perhaps the commonest lesion in syphilis of the spine, may also give rise to backache. Syphilitic synovitis occurs early in the disease, although the

[1] Archives of Dermatology and Syphilology, June, 1921.

resulting deformity and stiffness may remain indefinitely. Usually only three or four vertebræ are affected, but sometimes the whole dorsal region may be attacked. Hypotonicity of the ligaments and muscles of the sacro-iliac joints and the hips is a predominating symptom.

SNAKE POISONS AND THEIR TREATMENT.

THE cobra by reason of its wide distribution in India and the potency of its venom renders the problem of remedial treatment an extremely difficult one. It is rather surprising to learn from Major R. Knowles's address to the Royal Society of Tropical Medicine, which we reported in our issue of July 23rd, that even in untreated cases of cobra bite the mortality is not computed at a higher rate than 40 to 50 per cent.; but Major Knowles explains that the amount of venom injected may fail to reach a lethal dose through some fault in the mechanism controlling the ejection of venom, failure of the poison fangs to penetrate, or the protection of clothing. In contrast to the cobra, however, the viper, with the lightning rapidity of its stroke, greater certainty, and deadly earnestness, seldom if ever fails in its intention, and therefore allows far less chance of escape from its attack. The results of the numerous experiments carried out by Major Knowles and his colleague yield valuable information as to the minimum lethal dose (M.L.D.) and absorption period of cobra venom for the rat and the monkey (*M. rhesus*), and thus also for man, by calculation from the charted dose and death-time curve. Whereas the estimated M.L.D. for man is about 14–15 mg. of the desiccated venom and the absorption time probably not less than 10 minutes, the average yield of venom at a bite is computed at 14 or 15 times the amount required for a M.L.D. Indeed, the variation in the dose of cobra venom which may be yielded at a single bite, ranging from nil to 587 mg., is remarkable; however, provided one lethal dose is absorbed, the severity of the symptoms would not seem proportionate to the amount injected. Of the constituents and behaviour of the active principles contained in the colubrine and viperine venoms much has yet to be learnt. Their complex composition, is at present vaguely defined as comprising a "range of proteids and non-coagulable proteoses." Their toxic properties are, however, well recognised, and, for the cobra, include a hæmolysin, a cardiac stimulant, and a neurotoxin capable of paralysing the respiratory centre; whereas viperine venoms, in addition to a hæmolysin, possess a coagulin and a cytolysin or endolysin, which is rendered a most formidable lethal poison by its destructive action on the endothelial lining of capillaries and venules throughout the body. Future research by qualitative and quantitative analysis will doubtless throw light on the chemistry and relative amounts of these various toxic components of colubrine and viperine venoms, as well as on their neutralisation by antivenene—the venom-antivenom complex. We commented recently [1] on a series of investigations by Houssay, Negrette, and Sorrelli into snake venoms. Among the varieties of American, Australian, and Asiatic snake venoms studied, those of the cobra and Russell's viper were included. They were found to possess no amylolytic action, but were capable of splitting up lecithin, and gave evidence of proteolytic and strong hæmolytic power. These properties would explain the effect of neurotoxin on the respiratory centre, and of endolysin on the capillary endothelium, in colubrine and viperine venoms respectively. The specific proteolytic action of the venoms on the blood, as tested in vivo on the dog, showed that the coagulant or anticoagulant properties varied. In the early, or "positive," phase clotting by the coagulant venoms was due to precipitation of fibrinogen, but in consequence of this complete precipitation there followed a "negative" phase in which the blood was incoagulable. The action of the anticoagulant venoms, on the other hand, was due not to precipitation of fibrinogen or any formation of antithrombin, but to direct destruction of thrombokinase. Such changes may partly account for the apparently conflicting behaviour of the viperine venoms in causing both thrombosis and hæmorrhage.

The absorption period of a lethal dose of cobra venom being limited to so short a time as 10 to 20 minutes, it is obvious that remedial treatment to be effective must be extremely prompt. Of the many local remedies, apart from ligature or amputation, which have been advocated in time past, the Lauder Brunton technique of incising the bite and rubbing in crystals of potassium permanganate was for long regarded as a valuable remedy, whatever the nature of the venom. Its value depended entirely on promptness of application and on the uncertain chance that the oxidising power of the salt would be sufficient to destroy all the venom injected; in this respect its action was limited by failure to penetrate deeply enough for complete contact. Hypodermic injection of the zinc permanganate is now claimed to be far more effective in reaching the venom; better hopes even are entertained of the use of salts of the heavy metals—gold, platinum, &c.—and in particular palladium dichloride, which has such a destructive action on snake venom as to be the most successful of all local remedies yet tested. These measures are, however, but subsidiary compared with the invaluable neutralising action offered by prompt use of antivenene, particularly if given intravenously. The promise held forth by Calmette's introduction of this remedy was not fulfilled to the extent at first anticipated. There is, however, considerable hope that the process of immunisation now carried out at the Pasteur Institute at Kasauli may attain a high degree of perfection, and that the serum, improved, as Major Knowles has suggested, on the lines of concentration followed in the preparation of antidiphtheritic serum, may yield antivenene of assured potency and capable of neutralising the most lethal of venoms. Antivenene, as at present prepared, is essentially and purely a specific remedy. Whether it is possible, by a process of consecutive immunisation of the same animal against more than one type of venom, to arrive at a compound or polyvalent antivenene for universal use is at least open to doubt. The idea is, of course, no new one. Polyvalent power was claimed by Calmette for his original antivenene and was long the aim of the late Major Lamb. If proved practicable, it might solve the problems arising out of the specific nature of the various venoms. The present situation calls for coöperation with the biochemist; and we hope that the suggested trial of colloidal suspensions of the heavy metals, or the combination of concentrated antivenene with palladium dichloride, may lead to the discovery of the sure remedy of the future.

[1] THE LANCET, Sept. 25th, 1920.

TESTS OF APTITUDE FOR A TRADE.

ATTENTION has been drawn in THE LANCET to the economic cost of labour turnover in industry and to the need for greater care in the selection of workers, not only in order to promote efficiency, but also to lighten the strain upon health caused by uncongenial employment. The problem is double: the first part is concerned with choosing juveniles possessing special aptitudes for different kinds of work, whether for engineering, for mining, or weaving; the second is concerned with ascertaining whether any particular adult applicant for work possesses the requisite knowledge and skill. The latter, although not a simple matter, is the easier task, and it is characteristic of the practical trend of American thought that while others are considering the more difficult side, they seize upon and to some extent solve the simpler. In a book recently published [1] Mr. J. Crossby

[1] Trade Tests. By J. Crossby Chapman. Geo. G. Harrap and Co., Ltd., London. 1920. Pp. 435. 15*s*.

Chapman sets forth how, during the war, the recruiting authorities in the United States tackled the question of selection. There were many recruits to see and to classify, but few to act as assessors. Methods were devised by which the interviewing and classification could be carried out by persons who did not need to possess knowledge of the multifarious crafts concerned. Definite tests were devised:—An oral test in which clearly thought-out questions had to be answered in a definite way and were marked accordingly. A picture trade test was used in which the names and use of tools pictorially presented had to be given. Another group included performance tests in which work had to be performed not only in a definite way but in a definite time. A written group test was also employed in which the right answer to a question out of four alternatives had to be selected. The claim is put forward that the Army authorities succeeded, by the use of these tests, in grouping recruits according to their abilities in a way which saved sending overseas as mechanics or skilled craftsmen those who had no real knowledge of the work they claimed to know about and would be required to do; and, further, after testing the methods used against the somewhat haphazard methods in vogue in industry, that unskilled examiners, following out these methods, obtained far better results than skilled foremen and the like who usually undertake the duty of engaging labour. Mr. Chapman's application of these conclusions to labour selection should be studied in this country by those controlling its industries, and also by members of the profession interested in industrial hygiene.

THE SUBCUTANEOUS INJECTION OF VACCINE LYMPH.

THE possibility has often been discussed of obtaining protection against small-pox by injecting vaccine lymph subcutaneously instead of the present method of superficial scarification of the skin and rubbing in the lymph. It is contended that if there were no vesicles on the skin septic germs would be unable to find a point of entrance into the patient's system. Dr. S. A. M. Copeman, in 1898, discussed this question in his Milroy lectures and described experiments he had made by injecting subcutaneously vaccine lymph, diluted with normal saline solution, into monkeys, the result being that "some degree of protection was obtained against vaccinia" and presumably therefore against small-pox. Other investigators on the continent by injecting vaccine lymph into bovines and horses found that "by means of a generalised influence over the system, although unaccompanied by production of local results, it is possible to obtain immunity from subsequent vaccinia." These experiments, however, do not seem to have been very convincing and the subject was allowed to drop. It has now been raised again, this time in India, by Lieut.-Colonel C. F. Fearnside, I.M.S. (retired), Medical Superintendent, Central Jail, District Medical Officer and Sanitary Officer, Coimbatore, who contributes a paper "On the Injection of Lymph Subcutaneously as a Protection against Small-pox," to the recent Special Indian Science Congress Number of the *Indian Journal of Medical Research*. This observer has long been dissatisfied with vaccination by scarification, especially in view of the opportunities in India for acquiring septic infection. It is common, he says, for ignorant Indian mothers, as soon as the vaccinator's back is turned, to try to prevent the vaccination taking effect, and for this purpose the wet lymph is wiped off the child's arm with the mother's dirty fingers. All sorts of objectionable materials are applied to the vaccinated places, after the vesicles have formed, including the ever-blessed cow-dung poultice. The lanolated calf lymph in use in the Madras Presidency is prepared at the King Institute, Guindy, where it is put up in leaden tubes with a cap. To a spare cap Colonel Fearnside soldered on an ordinary hypodermic needle which, after being sterilised, was screwed on to a tube of lymph from which the protecting cap had been removed. The patient's arm was touched with a drop of tincture of iodine and the needle inserted beneath the skin. By pressure on the leaden tube a small quantity of lymph was forced through the needle beneath the skin. Four injections were made in each case. On withdrawing the needle, the point of exit was touched with tincture of iodine. This rough instrument does not allow of the amount of lymph injected being measured. The effect of these injections is the production of knotty swellings under the skin varying in size from that of a pea to that of a small almond, and they may persist for some time. During the last few years more than 800 prisoners in Coimbatore jail have been vaccinated in this manner. There was some focal reaction in 82 per cent. of these cases but no superficial vesiculation except where the needle had scratched the skin; all cases showing this reaction were classed as successful. Recently 12 of the prisoners were revaccinated in the usual way by scarification of the skin, but in no instance did any of them "take." This was regarded as a proof that they were protected by the previous hypodermic injections. At Colonel Fearnside's suggestion, Dr. F. M. Gibson, Director of the Guindy Institute, carried out some experiments with the subcutaneous injection of lymph on calves, but the results on the whole were not very satisfactory, though Dr. Gibson admits that such injections do confer a certain amount of immunity against vaccinia. This immunity, which is likely to be only of a temporary character, is in proportion to the amount of lymph injected. The knotty swellings are inflammatory nodules formed round the injected foreign matter, and are not due to growth of the injected lymph since material taken from the nodules early (in 86 hours) and late (in 168 hours), failed in every instance to produce vaccinia when rubbed into the scarified skin of calves. Colonel Fearnside states that he is not altogether satisfied with these experiments at the Guindy Institute, and suggests that further investigations should be undertaken in view of the great benefits that might be expected to follow the employment in India of a method of performing vaccination which would be free from the danger of septic infection.

MEDICAL BOOKS FOR LAY READERS.

CHRONIC diseases may be roughly classified according as they do, or do not, excite medical writers to publish books for the perusal of the patient. Pulmonary tuberculosis and neurasthenia belong to the first class, syphilis and diabetes to the second. It seems a little unfair that the benefits of this class of popular instruction should be so unevenly distributed, and to the medical writer aspiring to issue yet another book full of advice to consumptives, we suggest a preliminary study of a standard work such as Lawrason Brown's "Rules for Recovery from Tuberculosis," followed by consideration of the question: "Can I excel this book in matter, manner, or both?"

In his handbook[1] on the prevention and home treatment of tuberculosis, Dr. H. Hyslop Thomson has shown a sufficiently intimate knowledge of his subject, and discriminating appreciation of the factors which ultimately determine the fate of the patient to make his book worth writing and reading. With wisdom not always shared by other members of the tuberculosis service he writes: "Once the acute stage of the disease has been passed, the patient who relies upon his thermometer and knows how to use it intelligently, is the one who is least likely to relapse and who has the best prospects of recovery and of permanent arrest of the disease." Considering that the problem of tuberculosis bristles with controversial points, the manner in which Dr. Thomson threads his way through his book without committing himself

[1] Tuberculosis: Its Prevention and Home Treatment. Second edition. By H. Hyslop Thomson, M.D., D.P.H., County Medical Officer of Health and County Tuberculosis Officer for Hertfordshire. London: Henry Frowde and Hodder and Stoughton. 1921. Pp. 99. 4s.

to any opinion irreconcilable with the most generally accepted teachings of the day is remarkable, and he has achieved this result without resorting to the safe but dull device of stringing together platitudes. There is, however, one point on which we might join issue with him. Discussing precautions against infection, his advice to the consumptive is that "..... he should never, under any circumstances, swallow his sputum." This is a counsel of perfection. It is fairly certain that more than 50 per cent. of a consumptive's tubercle bacilli are swallowed, and this process is so continuous that were Dr. Thomson's advice to be strictly followed, the consumptive would outspit the irate llama and become an intolerable nuisance to himself as well as to his surroundings. Of course, the wholesale swallowing of nummular sputum is to be deprecated, but there are circumstances in the consumptive's career under which the expectoration of sputum into a bottle may have tragic consequences.

THE EFFECTS OF ULTRA-VIOLET RAYS ON THE EYE.

THE best known dangers to the eyes from ultra-violet rays, or rather from light rich in ultra-violet rays, are inflammations of the lids and conjunctiva, such as occur in so-called snow-blindness and in "electric ophthalmia." How far and in what way the deeper structures of the eye are liable to be affected is a matter of some uncertainty. It is generally admitted that the bulk of these rays do not get through the cornea, but it has been shown that a certain proportion of them penetrate as far as the lens. According to the observations of Hallauer, Schanz, Birch-Hirschfeld and others, the transmission of ultra-violet rays through the lens is individually very different, so that some lenses scatter the bulk of the rays that reach them towards the ciliary body or elsewhere, whilst others allow them to pass through to the retina. In the former case the effect may be an interference with the nutrition of the lens and so be a factor in the production of cataract. In the latter case it is suggested by van der Hoeve that in time the injurious effect on the retina may culminate in the disease known as senile degeneration of the macula, a progressive form of partial blindness to which old people are subject. The apparent fact that there is some antagonism between this disease and cataract is looked upon by van der Hoeve as a confirmation of his view.[1] On the other hand, as no one can maintain that ultra-violet rays are the main cause of cataract, it is obvious that this argument must not be pushed too far.

In an address delivered last May to a joint sitting of the Berlin Ophthalmological Society and the German Society of Illuminating Engineers, F. Schanz, the Dresden oculist who has long interested himself in the subject of ultra-violet rays, carries the indictment against them a step farther.[2] Cases have been recorded where the onset of a colour scotoma was proved to be the result of light from a mercury vapour lamp, the affection disappearing on the light being screened by protective glass. Behr, investigating 50 patients operated on for cataract, found that the sensibility of the retina, as shown by the increased difficulty in dark adaptation, was diminished in all cases. The number of ultra-violet rays reaching the retina must have been increased by the absence of the lens, but similar increased difficulty in dark adaptation followed exposure to the rays in eyes which were intact. Schanz argues that this species of disturbance of retinal function is far commoner than is generally supposed. He suggests that the well-known prevalence of night-blindness during the war may be partly accounted for on the supposition that many of these patients had had the sensitiveness of their retinæ injured by industrial employment involving exposure to ultra-violet rays, leaving them more ready victims to fatigue. The subject does not appear to have been sufficiently investigated as yet to warrant dogmatism. Senile degeneration of the macula, however, is a not uncommon disease and any clue to its pathology and possible prevention should certainly be followed up.

[1] American Journal of Ophthalmology, March, 1920.
[2] Supplement to Deutsche Optische Wochenschrift, 1921, No. 25.

ABDOMINAL PREGNANCY WITH LIVING CHILD.

Dr. E. C. Moore,[1] of Los Angeles, California, remarks that the number of recorded cases of abdominal pregnancy with delivery of a living child are uncommon, while those where the mother survived and the child lived a year or more are exceedingly rare. Of 77 cases collected by Kelly in 1898 of ectopic viable fœtus delivered by cœliotomy, 35 died within 50 hours of birth and only 7 lived for one year or more. Dr. Moore, who is of opinion that many others could be included if it were possible to obtain the necessary information, has collected 21 authentic cases of abdominal pregnancy with survival of mother and child, including Kelly's cases, and one of his own whose history is as follows: The patient was a woman aged 29, who was pregnant for the first time, although she had been married for more than five years. For about six weeks the pregnancy seemed to progress normally, and then she began to have some cramp-like pains in the lower abdomen. Operation was recommended but refused, and she remained in bed for ten days with occasional severe pain, which gradually diminished. Between the second and third months there was a slight bloody vaginal discharge. During the sixth month she had very little pain, but from that time onwards she vomited a great deal, and the fœtal movements caused much pain. At an operation performed in the eighth month the omentum and small intestine were found adherent to the anterior abdominal wall and covering a large mass which constituted the placenta, and was attached to the posterior surface of the right broad ligament and the lateral pelvic wall, and also extended up towards the liver, being attached to the omentum in this region. The uterus was about the size of an organ three months pregnant, and was pushed to the left by the placenta. The umbilical cord extended upwards to the left under the spleen, where the child was found lying free among the intestines, not surrounded by any sac. The entire broad ligament with the placenta was removed en masse. The child was a girl weighing 5 lb. 9 oz, and had no deformities. Information received from the mother about a year after the operation stated that both she and the infant were well.

[1] Surgery, Gynecology, and Obstetrics, July, 1921.

Dr. Frederick Langmead, Director of the Medical Clinical Unit at St. Mary's Hospital, Paddington, has been appointed Professor of Medicine in the University of London.

THE House and library of the Royal Society of Medicine, 1, Wimpole-street, London, W., will be closed during August for repairs and cleaning.

THE COUNCIL OF ALLIED PROFESSIONS.—The monthly regular meeting of the Council of Allied Professions was held at 11, Chandos-street, London, W., on July 19th. In the unavoidable absence of Dame Sidney Browne, G.B.E., R.R.C., the chairman, the meeting was presided over by Miss Rosalind Paget. Among other matters under consideration was the question of nurses and midwives being called away from their patients for jury service. It was unanimously resolved, "That it is in the interest of the community that nurses and midwives actually in the practice of their professions be exempted from jury service." It was decided to obtain the fullest possible support in the Federation of Medical and Allied Societies for this resolution and make the necessary representations. The means of utilising to the utmost extent the forthcoming journal of the Federation was also discussed, and proposals were submitted and unanimously approved whereby it would become the official organ of the societies.

ANNUAL MEETING OF THE BRITISH MEDICAL ASSOCIATION.

NEWCASTLE AS A PLACE OF MEETING.

NEWCASTLE-ON-TYNE is an interesting place for a medical gathering, and Prof. Drummond was right in suggesting that the local setting would give a characteristic tone to the meeting as a whole. The city and county of Newcastle has an estimated population of 286,000, not including the twin city on the other side of the Tyne, which is separate in sanitary and every other kind of administration, although everything except the actual houses pass freely across the bridges and make the health problems identical on the two sides. The birth-rate of Newcastle in 1920 was 28·0, and the death-rate 14·0, an exact half, a portent in itself to the southerner. The infant mortality rate in the same year was 101, the zymotic death-rate actually under 1. 837 cases of tuberculosis were notified during 1920, 593 of phthisis, 244 of other forms, being an attack-rate of 3·0 per 1000, with a death-rate of 1·64 per 1000; evidently the latter figure is the nearer the truth. Cancer was credited with 244 deaths, measles with 42, puerperal septicæmia with 5.

The housing problem in central Newcastle is complicated by the remarkable feature of the Town Moor, an immense open space belonging to the city which thrusts its nose to within half-a-mile of the river, and produces much the same problem as arises in New York. Water-carriage of drainage has, however, been introduced throughout the congested isthmus, some 5000 privies remaining for the present in two more distant areas lately taken over by the city. The town itself is full of relics of Tudor and Norman times, mixed up with the less noble mid-Victorian architecture, and along the Carlisle-road there soon appear traces of the great Roman Wall, the stones of which have been appropriated for domestic purposes in the section from Newcastle to Wallsend. Along the Tyne the amount of shipping, notable in ordinary times, is immensely enhanced at the moment by the number of huge cargo boats of many nations hung up by the coal crisis, and the many unfinished hulks of liners the despatch of which has been delayed for various reasons. A fleet of the new concrete boats was much in evidence.

The present is an anxious time for the sanitary administration of the city. The Corporation in a very natural spirit of economy has seen fit to reduce the actual estimate of the Sanitary Committee by £19,000, which has necessitated the release of 8 out of 20 health visitors and of a tuberculosis nurse. Visiting of pre-school children has been discontinued, and a number of infectious cases are treated at home on account of the reduction of fever beds. Fortunately hygienic indiscretion rarely brings immediate disaster, and it may be hoped that, after the stimulating visit of the British Medical Association, the city fathers may see their way to square the municipal balance-sheet by economies on less essential industries than those of public health. Dr. Harold Kerr, the medical officer of health, is keenly alive to the value of friendly coöperation, and, we believe, has introduced the principle of a weekly round table for discussion of health questions by the five full-time medical officers.

Figures given at the annual meeting of the Newcastle Insurance Committee, held during the medical week, show that there are 110 practitioners and 48 chemists on the panel, with 62 shops supplying drugs to insured persons, and somewhere about 118,000 insured persons. Councillor David Adams, vice-chairman of the Committee, is a convinced believer in the National Insurance Act as the proper basis upon which to build up a unified medical service in this country.

The city is happy in possessing so excellent a hospital as the Royal Victoria Infirmary, rebuilt on modern lines through the generosity of Lord Armstrong, and admirable alike in position and arrangement. But with a total of 160,000 out-patient attendances and nearly 10,000 in-patients in 1919, the city is considered gravely under-hospitaled, in spite of the fact that the adjoining Ministry of Pensions War Hospital, with its well-arranged bathing and massage department, will be handed over to the civil authority within a year or two.

Visitors to Gateshead were also aware of the urgency of local politics. The Guardians, having incurred a large outlay in relieving distress among miners' wives and children during the recent crisis, had levied a special rate of 1s. in the £ for immediate payment, with the result that a large number of ratepayers are making a strong protest, and an open-air meeting at Low Fell was largely attended.

ANNUAL REPRESENTATIVE MEETING.

(*Concluded from p. 198.*)

MONDAY, JULY 18TH.

Admission of Non-Members to Sectional Meetings.

ON a motion proposed by Dr. F. C. MARTLEY (Kensington) the question was raised of the exclusion of all but members of the Association from the scientific meetings. It was pointed out, however, that certain civil servants or members of the General Medical Council might be thus debarred from attending, and there was, of course, no wish to eliminate Americans. In the past even presidents had joined the Association on nomination. The motion was finally passed with a few dissentients in the following form:—

> That it be an instruction to the Council to provide that no member of the medical profession who is eligible for membership of the Association, but who is a non-member of the Association, shall take part in the sections of the annual meeting, unless in such circumstances as the Arrangements Committee may consider exceptional.

Subscription to the Association.

After the Treasurer had pointed out that the balance-sheet for the past year showed the necessity of raising the subscription to the Association, the followed revised rate was unanimously adopted, to come into force on Jan. 1st, 1922:—

A.—As to members resident in the United Kingdom.

(i.) For a member of the Association of not less than 10 years' standing as such who has definitely and permanently retired from the active practice of the medical profession, and has signed and transmitted to the treasurer a declaration to that effect—2 guineas.

(ii.) For any member of not less than 40 years' standing—2 guineas.

(iii.) For a member admitted to membership before the expiration of two years from the date of his registration under the Medical Acts—1½ guineas until the 31st December next occurring after the expiration of four years from the date of such registration.

(iv.) For two members being a husband and his wife residing together—4½ guineas.

(v.) Except as otherwise herein provided—3 guineas.

B.—As to members resident outside the United Kingdom.

(i.) For any officer of the Royal Naval Medical Service, the Royal Air Force Medical Service, the Army Medical Service, or the Indian Medical Service—2 guineas.

(ii.) For any other member—1½ guineas.

But in view of the difficulty of determining in any particular year the place of residence of a member of the Services, it was remitted to the Council to consider the advisability of a flat rate of £2 2*s.* for all active service members.

Student Class of Membership.

Various suggestions were made for making the Association more attractive to medical students. Unfortunately the annual meeting can only be held at a teaching centre when the school is not in session. Proposals for issuing a students' number of the

Journal once a month, and for dealing with medical matters from the students' point of view took no definite form, the following resolution being put and lost :—

That, in order to stimulate the interests of senior students of medicine in the work of the Association, and so tend to secure their adherence at the outset of their careers as practitioners, the B.M.A. institute a student class of members at a reduced fee, with the privilege of attending scientific meetings.

Expenses of Representatives.

A proposal to pay the out-of-pocket expenses of representatives who attend meetings of the Representative Body was withdrawn on the Treasurer pointing out that the minimum cost would be £2000.

State Reward for Scientific Research.

On the invitation of Newcastle-on-Tyne the meeting put on record its regret that the British Empire, with its world-wide possessions, cannot suitably reward the men who have done so much to render life supportable in its many climates, and instructed the Council to take all possible steps to induce H.M. Government to provide efficient reward for scientific work carried out in the interest of the State.

The Voluntary Hospital Principle.

A long debate on hospital administration was opened by the passing with practical unanimity of a motion proposed by Mr. N. BISHOP HARMAN, Chairman of the Hospitals Committee, to the effect :—

That the Representative Body desires to record its belief that the voluntary method of administration of the voluntary hospitals of the country is to the advantage of the public, medical science, and the medical profession, and that it should be maintained.

Only a single voice was raised to point out that the actual Government grant of half a million pounds shows the voluntary system to be incapable of keeping hospital administration efficient. Mr. Harman stated that the principle of voluntary administration would not be impaired in any way by payment of the medical staff. Freedom and elasticity were inherent in the voluntary system, which was more under the influence of the medical profession, and more appreciative of scientific work and research.

A second motion, that necessitous persons should continue to be treated free, was amended and passed in the form :—

That inability to pay for adequate treatment shall be the consideration for the admission of all patients for hospital treatment—

after it had been pointed out that the word "necessitous" is now generally accepted in a special sense in regard to the Poor-law, whereas numbers of the "new poor" are unable to afford adequate treatment outside the hospital. A rider to the effect that hospital treatment should not be given gratuitously to patients maintained in whole or in part by public funds was lost by a considerable majority, after an appeal by Dr. A. C. Farquharson, M.P., to enunciate the voluntary hospital principle, and leave the details for their voluntary committees to define.

Municipal and State Grants.

The third motion by the Chairman of the Hospitals Committee was as follows :—

That it is undesirable that the voluntary hospitals should be subsidised by the local rating authorities, except in so far as payment is made for the examination and the care of patients for whom these authorities are responsible.

The motion was accepted by the meeting in this uncompromising form, after refusing the qualification : "unless it be understood that such subsidy does not give the rating authority the right to interfere with the administration of the hospital."

In view of the materialisation of the grant to hospitals by the Ministry of Health the following motion and amendment were not dealt with, but were referred back to the Council :—

Motion : That in times of financial difficulty it is desirable that the voluntary hospitals should be subsidised by the central Government, and that such subsidy in the case of any individual hospital should take the form of a contribution proportional to the income received by the hospital from voluntary and other contributions. The subsidies here proposed should be made through some central hospital fund.

Amendment (by Brighton) : That, at the present time of financial difficulty, it is desirable that the central Government should subsidise voluntary hospitals. The subsidies here proposed should be made through some central hospital fund, and should not carry the right of any control in the management beyond that allowed to an ordinary private subscriber.

A fifth recommendation of the Hospitals Committee, expressing the view—

That greatly extended support for voluntary hospitals should be sought from employers and insurance companies, seeing that they benefit largely both directly and indirectly by the services of the voluntary hospitals

was adopted after discussion, in which it was pointed out that the provenance of hospital funds was a matter more for the general public than the medical profession to decide.

Recommendations six and seven of the Hospitals Committee were then passed in the following form :—

That every patient of a voluntary hospital who is able should make a contribution, during treatment, towards the cost of maintenance, unless the contributory method of subscription is adopted as essential in industrial areas. In view, however, of the increased cost of maintenance, &c., the Representative Body considers that the contributory rates paid by workmen should be materially increased.

That, where voluntary hospitals provide accommodation for paying patients, no fixed rate of payment for professional services rendered to such patients should be established ; the fees so payable to remain, as at present, a matter of arrangement between patient, family physician, and consultant.

An amendment to fix a maximum fee was decidedly rejected.

Formation of Medical Staff Fund.

Much time was given to a discussion of the allocation of funds to the medical staff in connexion with any contributory scheme, and the eighth recommendation of the Hospitals Committee was finally agreed to in the following revised and extended form :—

That in the event of decisions being taken which would lead to patients (other than paying patients referred to in foregoing Minutes) paying, in part or in whole, the hospital maintenance fees, either individually or by some contributory method, or with the addition of rate aid or State aid, or by a combination of two or more of these methods, a percentage of all such payments should be passed into a fund which can be allocated in any manner which such honorary medical staff may determine.

That when the board of management of a voluntary hospital enters into a financial arrangement with a public authority, an employer of labour, approved society, insurance company, or under a contributory scheme, for the reception of patients, such arrangement should be taken to cover the cost of maintenance and treatment, and a percentage of all such receipts should be passed into a fund which is at the disposal of the honorary medical staff of that hospital.

That it be an instruction to the Council to bring this resolution to the notice of the secretary and the senior honorary medical officer of each voluntary hospital, with a request that the policy therein outlined be adopted by the board.

There were about 15 dissentients to this resolution, some members feeling strongly on the one hand that it was impolitic to take a tithe of small payments from prospective patients, but that hospital boards in making any arrangement with paying bodies might reasonably contract for treatment as well as for maintenance. The medical profession, it was alleged, was willing to do philanthropic work in at least an equal proportion to that of other sections of the community.

Staff Fund and Voluntary Principle.

At this point a resolution proposed by Chairman of Council was taken, disagreeing with para. 50 of the Cave Report, which runs thus :—

"In connexion with the grants by public authorities it appears desirable to refer to the practice which obtains in some hospitals of carrying a proportion (from 10 per cent. to 20 per cent.) of these grants to a staff fund which is placed at the absolute disposal of the honorary staff. In some of

these hospitals, as at St. Bartholomew's, at the Royal Infirmary, Manchester, and at the Radcliffe Infirmary, Oxford, the fund has hitherto been applied by the staff to such purposes as the purchase of expensive apparatus or books, and the support of young practitioners taking up special branches of work; but in other cases the fund has been divided among the staff. The practice is supported by the British Medical Association on the ground that patients sent by a public authority are in the position of paying patients and that in the fees paid for such patient the medical practitioner is entitled to share. On the other hand, the honorary staffs of some hospitals are unwilling to share in such a fund; and two distinguished physicians expressed the view that if the medical staffs came to be subsidised to any substantial extent 'the bottom would drop out of the voluntary system.' It should be remembered also that, although the services of the staff are honorary, they obtain a valuable return in the form of medical and surgical experience and the enhanced reputation which accrues to a member of the visiting staff of a great hospital. If the system of carrying a percentage to a staff fund is confined to cases where the full cost of maintenance and treatment is paid by or on behalf of the patient, not much objection can (we think) be taken to it; but any extension of the practice beyond those limits appears to us to endanger the future of the voluntary hospitals."

The disagreement was unanimous, the meeting maintaining its conviction "that the essence of the voluntary hospital system is the independent and voluntary management, and that this is in no way related to the conditions of service of the medical staff."

Paying Patients in Poor-law Hospitals.

The report on the future of Poor-law hospitals came in for both general and detailed criticism, a motion to refer back the whole question for further consideration receiving influential support. The argument to await the decision of the new health authority was countered by the urgent need for the competent medical authority to lay down a considered scheme of procedure, in view of the fact that boards of guardians all over the country, and especially in Middlesex and Lancashire, were experimenting in various degrees with a combination of infirmary and private paying hospital. The "administrative control" of the medical superintendent was accepted without too precise definition of its interpretation, boards of guardians to be educated in accepting the principle of treatment by general practitioners. The selection of district medical officer by the practitioners of the area was regarded as desirable. Finally the recommendations of the Hospitals Committee were accepted in the following form:—

1. That in those Poor-law infirmaries where there is spare accommodation and when the needs of the Poor-law patients have been met, it would be desirable that certain beds should be set aside for private patients paying a fee to be settled by the guardians; that where a general practitioner wishes to continue to treat therein patients of his own, he should be allowed to do so under the general administrative supervision of the medical superintendent, and that any of these patients should be allowed to call in a consultant from outside, the patient bearing the cost thereof.
2. That for "paying" patients admitted to infirmaries there should be an inclusive charge to cover the cost of medical supervision, maintenance, nursing, food, and medicines, within the ordinary tariff and pharmacopœia of the infirmary, the patient paying his medical attendant independently.
3. That any extra nursing and any food or medicine ordered over and above those allowed under the ordinary tariff and pharmacopœia of the infirmaries should be charged as extras to the patient.
4. That all medical attendance by private practitioners on "paying" patients in infirmaries should be under the administrative supervision of the medical superintendent of the infirmary.
5. That infirmaries, so far as practicable, should be utilised for medical education.
6. That in any hospital maintained by a local authority (including the board of guardians) for general cases, provision should be made for wards for the reception on the lines of the suggested primary health centre as outlined in the Dawson Report of private patients admitted on the recommendation of their own practitioner who should be able to attend these patients in such wards.
7. That municipal hospitals should be controlled by an ad hoc committee on which there should be a small but definite representation of the medical profession, nominated by members of the local profession.
8. It is desirable in the interests of the patients that the medical superintendent should have power in special cases (including cases of urgency) to admit or retain patients from other parishes, the guardians being empowered to recover the cost of maintenance thereof from the parish or borough in which the patient resides.
9. That to meet the need of accommodation for senile and chronic cases a part of the Poor-law institution be separated from it whenever possible, which should be formed into an infirmary dependence under the control of the medical superintendent of the infirmary.
10. That certain classes of cases—e.g., tuberculosis and certain infectious fevers not already provided for—should not be accommodated in general infirmaries, but in special hospitals arranged for this purpose.
11. That the normal method of admission to an infirmary should be on the recommendation of a general practitioner.
12. That district medical officers be selected from the private practitioners of the neighbourhood.
13. That, except for the treatment of private patients, the normal medical staff of an infirmary should be a combination of the whole-time resident staff or a part-time selected staff with part-time specialists, the last being called in by the medical superintendent as and when necessary.

Criticism of the scheme as impracticable in rural areas was met by an assurance that it was only intended as a guide to general principles, modifications to be introduced to meet local needs and requirements.

TUESDAY, JULY 19TH.

Hospital Provident Scheme for London.

On behalf of the Metropolitan Counties Branch Council Mr. W. MCADAM ECCLES brought forward a motion asking for approval of the national provident scheme, drawn up by the Branch Council, for hospital and additional medical services. This scheme was described in detail by Mr. Eccles in THE LANCET of May 14th last, p. 1057. Mr. H. S. SOUTTAR said that the scheme had been called revolutionary, but it was absolutely necessary in view of the bankruptcy of the London Hospital, for example, which simply could not be carried on without some such assistance. It was the business of a nation to provide its own hospital treatment. After some discussion the meeting decided to take no attitude to the scheme for the present.

Salaries of Non-professorial Teaching Staff.

On a motion to fix minimum salaries in three grades for the medical teaching staff other than professors and their assistants, it was agreed that many teaching institutions at present had the desire, although they lacked the ability to pay adequate salaries. The case was not quite parallel with that of municipal authorities who had the rates to draw upon. There was strong pressure put on the meeting not to be too tender with college authorities, which had for years sweated their teachers, but the meeting decided that the time was not opportune for taking action.

Medico-Political Committee.

Mr. E. B. TURNER, Chairman of the Medico-Political Committee, in moving the adoption of the relevant part of the report, outlined the directions in which his committee was fighting for the interests of the practitioner. It was still the aim to obtain taxation of the doctor's motor-car on the basis not of horse-power but of annual consumption of spirit, and to get a concession for the second car. Post office medical officers were receiving the full support of the Association. The Dangerous Acts Regulations, in so far as they interfered with the practitioner's work would, he thought, fizzle out in a short time. The principle of the Whitley Council was being watched in regard to its effect in weakening the authority of the Association.

Whole-time Medical Officers and Private Practice.

A motion by Portsmouth was brought forward to the effect:—

That the Representative Body is of opinion that medical men practising as whole-time officials of public authorities should be precluded from practice for private reward in the same district (i.) while holding their appointments; and (ii.) for a period of five years subsequently, except with the consent of the local medical profession.

This was withdrawn when it became clear that its enforcement would require a bond in the agreement, instituting the appointment, as well as legal enactment, to give effect to it.

Fee for Notification of Infectious Disease.

The Representative Body once again authorised its Council to press for the restoration of the 2*s.* 6*d.* notification fee "forthwith and without delay."

Report on Maternity and Child Welfare.

A weighty report on the value of maternity and child welfare work, in relation to the reduction of infant mortality, was brought in by the Medico-Sociological Committee. Dr. E. R. Fothergill acted as chairman of this committee, and Dr. Alfred Cox as secretary, and a number of members were coöpted representing voluntary child welfare associations. The report, issued in the supplement of the *British Medical Journal* for July 2nd, has been reprinted in pamphlet form at 3*d.*, obtainable from the offices of the Association. Its conclusions, signed by every member of the committee, run as follows:—

1. Maternity and child welfare work has contributed in an appreciable degree to the reduction of infant mortality that has taken place, but it is too early to determine to what extent it has been effective.
2. The effect of many of the causes of infant mortality can be lessened by the education of women at centres and in their homes.
3. The educational work amongst the mothers on the racial poisons (alcohol, syphilis, and tubercle) and on the influence on infant mortality of pollution of the air by smoke and other impurities with the consequent deprivation of sunlight, should be encouraged and extended.
4. The instruction of the elder girls at school in homecraft and mothercraft should be developed and encouraged.
5. Every effort should be made to improve the economic position and prospects of midwives and midwifery nurses; and encouragement should be given to them by local authorities wherever there is difficulty in securing a sufficient supply.
6. The provision of sufficient hospital accommodation for diseases of pregnancy and difficult confinements, and maternity homes for normal confinements which cannot conveniently be conducted in the patients' homes, should be made general as soon as possible.
7. The primary and main object of maternity and child welfare centres should be educational, preventive, and advisory; no treatment should be given for conditions which, in the absence of the centre, would be recognised as calling for the attendance of a medical practitioner; it is against the best interests of the centres to encourage women to go to the centre for what they can *get* rather than for what they can *learn*.
8. There are advantages to the work in associating with the centres a body of voluntary workers, but the whole of the work should be under the control of the medical officer of health in order that all the preventive agencies may be coördinated.
9. The support of the local doctors, nurses, and midwives can and ought to be secured. This can be done if (*a*) it is made clear that the sphere of the centres is restricted as recommended above, and (*b*) if members of these professions are represented on the statutory committee and the committees controlling the centres, these representatives being nominated by the local organisations of these professions wherever such exist.
10. The experience of the "family doctor" would be useful in the work at the centres; but that practitioners accepting the appointments must have knowledge of and a real interest in the work; the appointment should be for a long enough time to be administratively convenient; and those appointed should clearly realise that in accepting the post they must undertake to carry on the work irrespective of other claims on their time.
11. For every mother and child up to 5 years of age there should be available domiciliary attendance by a family doctor.
12. In order that medical practitioners should be fully equipped for maternity and child welfare work it is desirable that the medical student should be educated in and be encouraged in the practice of duties in relation to (1) personal and domestic hygiene, and (2) industrial hygiene and other spheres of preventive medicine.

There was no opportunity at this late hour in the meeting of considering the bearings of so far-reaching a document, and after some dissent had been expressed it was decided to take no attitude towards the report at present.

Election of Officers.

Voting took place on Saturday, July 16th, for the four members of the Representative Body chosen by them to serve on the Council for 1921–22. The members elected were Dr. H. G. Dain, Dr. R. Langdon Down, Dr. J. A. Macdonald, LL.D., and Mr. E. B. Turner. On Monday, July 18th, Sir Clifford Allbutt was elected a vice-president of the Association in recognition of his services as president from 1916–21.

THE ANNUAL GENERAL MEETING.

The annual general meeting opened in the King's Hall, at 2 P.M., on Tuesday, July 19th, when the retiring President, Sir CLIFFORD ALLBUTT, gave a brief valedictory address in which he set out the reward of his long service already received in new friendships, and an intimate knowledge of the working of the Association from the inside. He then inducted his successor, Prof. DAVID DRUMMOND, who felicitously compared the annual gatherings of the Association at different centres to the passage of the soul through life, changing its body but retaining the spirit of its being. Newcastle had ploughed its own furrow and attempted to make the Association meeting a success on its own lines. After approval of the minutes, and appointment of auditors, the President introduced Sir WILLIAM MACEWEN as President-elect for 1922–23. Prof. R. A. BOLAM, as Chairman of Council, then tendered hearty thanks to the retiring President, which were carried by acclamation.

At the adjourned meeting in the evening Prof. DRUMMOND delivered his presidential address, entitled "The Medical Profession: a Horizon of Hope," an abstract of which appeared in last week's issue. Prior to the address Mr. R. J. WILLAN, hon. local secretary, introduced to the President the foreign guests of the Association, Prof. MURK JANSEN of Leiden, and Prof. H. BROOKER MILLS of Philadelphia. A vote of thanks for the address was proposed by Sir JAMES BARR, who veiled under a playful guise a serious criticism of the emphasis laid by the President on the end-results of disease rather than on earlier remediable changes. This done, the Association's gold medal of merit was handed to Sir DAWSON WILLIAMS for his distinguished services to the Association and the medical profession as Editor of the *British Medical Journal*. A substantial cheque was handed to Dr. J. A. MACDONALD, past Chairman of Council and a former chairman of the Representative Meeting, as a token of friendship and appreciation. Dr. Macdonald, in returning thanks, referred to the growth of influence of the Association since its reconstruction in 1900.

The reception at the Assembly Rooms, which followed the address, was noteworthy for the number of medical women who attended in doctors' gowns.

Honorary Degrees Conferred at Durham.

At a special Convocation held in the Castle Hall, Durham, on the afternoon of Thursday, July 21st, honorary degrees were conferred upon a number of distinguished medical men. Prof. DAVID DRUMMOND, Vice-Chancellor of the University, occupied the chair, and was supported by members of the Senate. Sir William Macewen, Sir Thomas Oliver, and Sir Humphry Rolleston received the D.C.L., while the D.Hy. was conferred upon Dr. T. Eustace Hill and Dr. J. Wilkie Smith, the D.Sc. upon Sir Arthur Keith, the D.Litt. upon Sir Dawson Williams, and the M.A. upon Dr. Alfred Cox.

The Durham visit coincided with that of a group of overseas professors attending the Oxford Conference of the Universities of the British Empire. The presidents or deans of the universities of Alberta, McGill, Toronto, Bombay, and Madras were present, the two latter being the guests of Dean Welldon.

The Annual Dinner.

At the annual dinner held at the Assembly Rooms Club on Thursday evening, July 21st, Prof. DRUMMOND presided, and it fell to Dean WELLDON to propose

the toast of the British Medical Association, which he did in a speech of weighty content with an amusing setting. The medical man, he indicated, wrested Nature's secrets from her and made them known to the whole world, but his patient's confidences should be inviolable. Whatever sanctity attached to the confessional attached also to the consulting room, and greater even than the attainment of justice he held to be the maintenance of confidence between man and man.

Dr. BOLAM, in responding, said there was a feeling throughout the land that the time had come when the common law, based as it was on precedent and custom, must stand aside, or the medical man could not carry on his work with the true and complete confidence of the community. Dr. T. W. H. GARSTANG proposed the health of the guests, Sir THEODORE MORISON replying, and Sir HUMPHRY ROLLESTON toasted the President, Prof. Drummond, who in his reply paid a well-earned tribute to the labours of Mr. Willan, F.R.C.S., the local medical secretary of the gathering. During the dinner the wives and daughters of members were entertained by the Ladies' Executive Committee, of which Mrs. Bolam was chairman.

The dinner was followed by a dance in the King's Hall of the Armstrong College, a beautiful room for a social function, and some 250 guests worked through a serious programme of valses, fox-trots, and one-steps.

Civic and other Receptions.

The Lord Mayor entertained the President and a number of office-bearers of the Association to dinner at the Mansion House on Monday, July 18th. Sir CLIFFORD ALLBUTT, who replied to the toast of the Association, recalled that it was Newcastle, in 1870, which first offered civic hospitality to the Association. Medical men, he said, living more or less separated, were apt to get a little angular and individualistic. The Association had done much to bring them together, to compromise their various views, and to work together in mutual coöperation.

On Wednesday afternoon, July 20th, Councillor T. W. Rowe, Lord Mayor of Newcastle, entertained more than 1000 guests in the beautiful municipal gardens of Jesmond Dene. The Sheriff, Councillor Anthony Cates, was also entertaining, and the local dignitaries included the Bishop of Newcastle and the Spanish Consul. The weather, as throughout the meeting, left nothing to be desired, and the occasion was one of unaffected gaiety, to which St. Hilda's Band and the Folk Dancing Society materially added.

Dr. and Mrs. Eustace Hill welcomed 700 guests on behalf of the North of England Branch of the Association at the Hancock Natural History Museum on the same evening. The entertainment included the Elswick Works orchestra and admirable part singing by the Wallsend Male Voice Choir. The evening was reminiscent of the famous reception at the South Kensington Natural History Museum on the occasion of the last International Congress of Medicine. The Hancock Museum is renowned for the skill and artistic sense with which its birds are mounted, and in this respect, as well as in the possession of a Great Auk fledgling, the collection is unrivalled. Its able curator, Mr. Leonard Gill, was there to demonstrate the attractions.

Dr. and Mrs. R. P. Ranken Lyle gave a garden party to the ladies accompanying the representatives on Saturday afternoon, July 16th, when many tennis courts and croquet lawns were placed at the disposal of the guests.

Religious Services.

On Tuesday, July 19th, at 5 P.M., officers and members of the Association, in academic dress, attended divine service at St. Nicholas's Cathedral. Canon G. E. Newsom, vicar of Newcastle, conducted the service, the lesson being read by Rev. W. J. Jack, hon. secretary of the Free Church Council, an address being given by Dr. H. L. Wild, Bishop of Newcastle, who outlined the history of medical science from the middle of the sixteenth century on. So far, he said, as profitable knowledge went, large sections of our population, not especially of any one class, might as well be living in the dark ages. He would like to see the removal of prevailing ignorance become the concern of the whole medical profession, and he would particularly welcome addresses to the young by medical men and women of faith and vision on the use and abuse of body and mind.

Members of the Guild of St. Luke, St. Cosmas and St. Damian attended special mass at St. Mary's Cathedral, Newcastle, on the morning of Thursday, July 21st, when Father Elrington, D.Sc., set out in his address how a doctor can be a minister to the spiritual as well as to the physical needs of humanity.

Sunday Addresses on Temperance and Public Health.

A number of medical men attending the meeting took the opportunity on Sunday, July 17th, of dealing in public with various aspects of the alcohol question. At the West End Brotherhood Dr. E. R. Fothergill, of Brighton, gave an address on "Alcohol as a Beverage in Relation to Present Social Problems." Public opinion needed to be Christianised and then concentrated on social problems, when a solution for national alcoholic vice would be found. Dr. Mary Sturge, of Birmingham, spoke to a P.S.A. gathering at the Central Hall of the danger to offspring of alcoholism in the parents. It should, she thought, be part of the education of young men and women contemplating matrimony to go round the idiot asylums and see the large amount of mental deficiency attributable to parental excess. At the Byker Brotherhood Dr. Horace Rose, of Aylesbury, warned his hearers that the excesses of youth were a draft upon middle age. Speaking from 25 years' medical experience he had never known alcohol to be of any use to anyone at any time. Dr. F. C. Coley, of Newcastle, addressed the Felling Brotherhood on "Delusions about Drink." To stop the manufacture of alcohol for beverages would, he believed, do more to combat tuberculosis than the work of all the sanatoriums. At the Bentham Brotherhood Dr. W. L. Reid, of Glasgow, referred to medicated wines as an insidious and dangerous form of alcohol.

Sir Thomas Oliver, at the Chester-le-Street Brotherhood, speaking on "Success *v.* Failure," suggested that the avoidance of the wine cup tended to the creation of reliable citizens. Mr. W. McAdam Eccles at the Friends' School, Pilgrim-street, reminded his hearers that all human beings were born teetotallers, and Dr. F. B. Rutter, of Mere, Wilts, exhibited instructive diagrams and charts. Mr. Eccles gave another address later in the day at the Brunswick Chapel entitled "Great Facts concerning Alcohol." Dr. Courtenay Weeks gave an address on "Alcohol and National Efficiency" at St. Nicholas's Cathedral to a congregation which included the annual church parade of ambulance and nursing units of the St. John Brigade, and dealt with the immeasurable amount of damaged child-life directly due to drink. Dr. George Morgan, of Brighton, also spoke on "Alcohol and the Child" at the Willington Quay Brotherhood. The cumulative effect of all this teaching from medical men, with intimate first-hand knowledge of what they were speaking about must have been considerable.

Dr. George Jessel, of Southport, gave two addresses on Sunday, July 17th; in the morning at the Church of the Divine Unity, in the evening at the Unitarian Church. Ignorance was at the bottom of much ill-health, and there was a great need for a well-organised and persistent campaign to inculcate the laws of health. The rich, he said, were as ignorant in this respect as the poor, but whereas the former could afford to pay for their mistakes, the latter not only suffered grievously themselves, but became a charge upon the rest of the community. Organised religious bodies had a direct interest in supporting health measures, especially on the educational and moral side. We needed, however, to get away from the idea that there was a monopoly in spiritual insight.

Concurrent Meetings.

The Temperance Breakfast.—A large number of delegates attended a breakfast on Thursday, July 21st, given in the Grand Assembly Rooms by Sir George Hunter, D.Sc., Vice-President of the National Temperance League. Sir A. Pearce Gould, who made a special journey from London to attend, said that it was a matter of common knowledge how rapid had been the decline of alcohol as a therapeutic agent during the last 30 years. Pharmacologists now agreed that alcholol was of value only as a narcotic, and not as a stimulant. He submitted that the medical profession had not yet shouldered its full responsibility in regarding the alcohol question as a problem in biology. We now had useful scientific knowledge of the effect of alcohol in medical, social, and economic aspects, and a simple, clear, and faithful witness to scientific truth on the part of medical men would, he was assured, meet with a great response. Rev. Courtenay Weeks, M.R.C.S., who submitted a resolution, desired that the fullest advantage should be taken in schools of the syllabus on the hygiene of food and drink recently issued by the Board of Education. Lady Barrett and Captain W. E. Elliot, M.P., also spoke briefly and effectively.

Irish Graduates' Association.—The forty-first summer meeting of the Irish Medical Schools' and Graduates' Association was held at the County Hall, Newcastle, on Wednesday, July 20th, the chair being occupied by Dr. J. A. Macdonald, in the absence of the president, Major-General W. W. Kenny, A.M.S. The best way, Dr. Macdonald said, to promote good fellowship between Irishmen was to give them opportunities of meeting socially. The Association wished to break down the barriers still preventing the highest diplomates of Irish Royal Colleges from candidature for honorary appointments at English general hospitals, and was determined to go on until successful.

Conference on Cripples.—During the Association's meeting an important conference took place in the library of the Royal Victoria Infirmary on the treatment and education of physically defective children, under the joint auspices of the Newcastle Invalid Children's Aid Association and the Central Committee for the Care of Cripples. Lady Parsons presided, and the morning session was devoted to the curative, the afternoon to the administrative, aspect of the question. Some account of this conference will be given later.

Local News Items.

Newcastle medical men and other local residents placed their motor-cars at the disposal of the representatives all day on Sunday, July 17th. Lunch was taken at Rothbury after a walk along the rocky bed of the Coquet. Lord and Lady Armstrong personally conducted the party over their house at Cragside, with its wonderful rock garden. In the afternoon the route was by Alwinton and Elsdon Common, over the lower slopes of Cheviot, with tea at Otterburn, hard by the famous mill of soft woollen shawls. Trout streams, herons, black-faced sheep, and remains of extensive Canadian tree-felling were among the natural objects shown. The occasion was one of happy comradeship, which had its effect on the resumed Monday meeting.

The Medical Institute, at 7, Windsor-terrace, generously placed at the disposal of visitors during the medical meeting, was formally opened on Tuesday, July 19th, by Sir Clifford Allbutt, Prof. David Drummond presiding. The Institute is the gift of Dr. J. Wilkie Smith, to the memory of his son killed in the war, and is arranged as a club for local medical men, with billiard and luncheon rooms, lounge, a meeting room capable of seating 40 or more, and several bedrooms reserved for short period visitors.

The opportunity was utilised by members of seeing the scientific study being given in Newcastle to rescue work in mines. On several afternoons Mr. F. P. Mills, chief officer of the Northumberland and Durham Colleries Fire and Rescue Brigade, gave a demonstration at the Scotswood Road Station. The fire brigade responded to a call in 20 seconds. An imitation pit shaft is being sunk where prospective colliers can go through a preliminary training in darkness and exposure to gases, learning there the confidence which is a chief safeguard against avoidable accident. Sir James Cantlie's suggestion to found a college of ambulance in Newcastle met with a warm reception locally. The secret of success in first-aid lay, he said, in improvisation.

Sir James Cantlie's exhibit of the Thomson machine, being a table designed to enable an armless man to perform all the ordinary occupations of life, attracted a large amount of local interest. Designed by a gasfitter, this marvellous table was shown in action, a man bereft completely of both upper limbs eating an egg, lighting and smoking a cigarette, writing a letter and sealing it in an envelope. The demonstrator had in fact taught himself to write on the machine, having previously been illiterate.

During the gathering was held the annual meeting of the Newcastle Industrial School, of which Mr. J. Alaric Richardson is chairman. The Committee is happy in having acquired a country mansion, Axwell Hall, eminently suitable for the proper segregation and education of truant boys, and surrounded by ample grounds. Officially truancy is on the decrease in Newcastle, although the streets and parks do not quite confirm this impression.

Members of the general press attending the representative meeting admitted that they found the discussions hard to follow, the motions and amendments not always bringing out clearly the points on which the meeting wished to express its opinion. In concerning itself with the sources of hospital revenue it was suggested that the matter was actually outside the province of the medical profession, although to take an interest in it was praiseworthy. Elocution was felt to be at a low ebb as compared with other professional gatherings, but the brevity of spokesmen was highly commended. Favourable comment was made upon the plan of numbering representatives' desks with a large figure, thus making identification easy.

Where so many contributed to the success of the meeting and to the happiness of the guests it would be invidious to mention names other than those of certain members of the General Executive Committee who were sectional chiefs. Dr. W. J. Durant organised the excursions, Dr. N. MacLay the annual dinner and catering generally, Dr. E. Farquhar Murray the hotel accommodation, Dr. F. J. Nattrass the evening functions, and Mr. G. Grey Turner the pathological museum. As chairman of the Ladies' Executive Mrs. R. A. Bolam was responsible for the well-organised ladies' club.

During the week an exhibition of surgical instruments, drugs, foods, &c., was held in St. George's Drill Hall, St. Mary's Place. There were 82 exhibitors, and the whole was representative in a high degree of the best commercial enterprise in the medical and allied sciences. Some account of the exhibits will follow.

MANCHESTER ROYAL INFIRMARY.—During the past year 57,200 persons received treatment. The annual cost of each bed was £179, and each patient cost £3 8*s.* 6*d.* a week.

UNIVERSITY OF BRISTOL: POST-GRADUATE COURSES IN MEDICINE.—During the past session a series of weekly clinical demonstrations was given to post-graduate students at the hospitals which constitute the clinical school of the University of Bristol. The number of medical men who attended showed an encouraging advance on last year, and the attendances remained consistently high throughout the course. The committee in charge of post-graduate organisation is now making arrangements for courses of lectures and demonstrations which have been asked for by practitioners in Wiltshire through their British Medical Association divisions. So far it has been decided to hold these courses at Trowbridge and at Swindon, and to these centres others in the counties round Bristol will doubtless be added. Inquiries should be addressed to the Director of Post-Graduate Studies, University of Bristol.

KING GEORGE'S SANATORIUM FOR SEAMEN.

THE Seamen's Hospital Society has, during its century of existence, done great things for the sick sailor, and to its other benefits, helped by the enterprise of Lord Inchcape, has now added a splendid sanatorium for the tuberculous, well planned and situated in lovely grounds at Bramshott in Hampshire. The menace of tubercle to the merchant marine is dire. In the last statistics on the deaths of seamen published by the Board of Trade, covering the year ending June 30th, 1914, there are shown deaths by tuberculosis as under:—

1913–1914.	Lascars.	Foreigners.	British.	Total.
	45,571	29,699	170,439	245,619
Deaths from tubercle				
General	3	1	2	6
Pulmonary ..	26	16	22	64
Total	29	17	24	70
Death-rate per 1000	0·64	0·57	0·14	0·28

These figures give us death-rates only; there are no statistics of illness. The only other statistics of illness in the merchant marine available are those so valuable presented to the Royal Society of Medicine by Dr. Arnold Chaplin from his 16 years' experience in the Eastern trade, in which the Lascar death-rate from tubercle was stated as 0·47, and the European death-rate as 0·14 per 1000, figures very similar to those given above. Dr. Chaplin gave the attack-rate as 5 per 1000 for Lascars, 2 per 1000 for Europeans; and those figures suggest that for each death shown about 12 cases occur (10 Lascar, 14 European). The statistics of health of the Royal Navy suggest a very similar position.

We may assume, then, that for 70 deaths from tuberculosis in the merchant marine there are probably upwards of 700 cases of the disease afloat in the ships. How far it will be possible to deal with these patients under the National Health Insurance we cannot yet say. Complaints are being made in certain quarters that the seamen's contributions are at present being in great measure lost. But, at any rate, a start has been made towards coping with the problem by the Seamen's Hospital Society. The new sanatorium at Bramshott, which was opened on July 12th by the Duke of York, is called King George's Sanatorium for Sailors; it is built on a property of 100 acres, some of which is at present let. A house already on the property has been made into a nurses' home, and in the sanatorium itself accommodation is now available for 80 cases and is arranged in a crescent facing south, in two stories, with two ten-bed wards at each end; single and double cubicles fill in the space between these wards. Furniture is reduced to a minimum; all corners are rounded, the floors are "jointless," the southern side of the cubicles is all glass, and the casements open conveniently. Certainly the patients are fortunate in their surroundings; an extensive lawn, magnificent trees, and a dry soil, with shelter from all violent winds, give them every opportunity for recovery. As money increases further crescentic sections will be opened on the ground already owned. At present two more are in prospect, which will make it possible to receive 240 patients. The few cases already transferred are being treated by a physician who is in practice near by, but it is intended shortly to appoint a resident physician and superintendent; the matron and nurses are already in occupation. A recreation room for the patients is to be constructed; gardening and other trades will be taught, a carpenter's shop being already prepared. It will be seen that the sanatorium is being directed on wise lines, and, as the Duke of York said in his opening address, any who feel gratitude to sailors for their work in the war may well give that gratitude expression by sending a subscription to King George's Sanatorium for Seamen, Bramshott Manor, Hants.

BUDAPEST.

(FROM OUR OWN CORRESPONDENT.)

Children and Milk-borne Diseases.

THE statistical bureau of Budapest has just issued its annual report for 1920, in which it is stated that notwithstanding unusually prolonged periods of intensely hot weather, there were fewer deaths of children under 5 years than in any preceding summer; for the first time in the history of the city the summer mortality fell below 50 per 1000 per annum. The Committee for Distribution and Supply of Pure Milk to Babies undertook the supply of pasteurised milk in 1906; 2112 children under 5 years died in the summer of that year. In 1920 there were only 1710 deaths in a population of children larger by 45,000 than that of 1906. The Committee are convinced that pasteurisation of milk supplies of the cities and towns, under careful supervision of medical officers, would still further reduce the death-rate.

Myopia in School-children.

Dr. Bogdan, in his account of the examination of 200 text-books from a hygienic point of view, draws particular attention to the fact, already established by many prominent investigators, that myopia in children either originates from or develops in the schoolroom. The chief cause is the too prolonged reading, writing, and drawing; undue strain of the muscles of accommodation causes an active hyperæmia; the venous circulation is hindered, there is an increase in intra-ocular pressure, and the sclerotic is gradually stretched. Too strong convergence works even greater harm. It is, of course, understood that in some children near-sightedness is hereditary, and, as a result they become affected more quickly than their healthier comrades. Near-sightedness may also be the result of insufficient light and improper equipment in desks and other school furniture. Dr. Bogdan insists that paper used in text-books should not have a glossy surface. Under artificial light a glossy surface causes improper focussing of the eye and necessitates frequent changes in the position of the book as well as of the head. The paper should be thick enough to prevent the print on one page from penetrating to another. A few authorities have recommended yellow paper, but the majority favour white paper, which gives a sharper contrast between the printed matter and the background.

Simultaneous Occurrence of Syphilis and Tabes.

Dr. Frey, lecturer on nervous diseases, stated his conclusion from a large number of recorded cases, that with pronounced tabes the syphilitic virus may still continue active within the body, hence a combination of manifest syphilis of the skin or internal organs with typical tabes is not a very rare occurrence. It seems that syphilitic spinal meningitis is particularly common. With later occurrence of tabetic symptoms, active syphilis is less common, as observed by Adrian in Germany. The combination is more frequent in the male sex, in which syphilis is oftener encountered and the disposition to posterior degeneration greater. Tabes appears later in the majority of cases than tertiary lues; thus a somewhat more favourable prognosis may be made where both conditions are combined, since the process may often be arrested by active antisyphilitic treatment.

Venereal Prophylaxis.

Dr. Lükö has reported the results of venereal prophylaxis, as carried out in the Hungarian Army. All men who have exposed themselves to the risk of venereal infection have to report to the medical

officer next day. The method of prophylaxis is as follows: The entire penis is scrubbed with liquid soap and water for several minutes, and then washed with perchloride of mercury solution, 1–2000. If any abrasions are present, these are sprayed with peroxide of hydrogen. Two urethral injections of protargol 10 per cent.) are then given and retained for five minutes. The whole penis is then rubbed with 33 per cent. calomel ointment, which is kept on for several hours. It is stated that these measures have greatly reduced the percentage of venereal disease in the service, and that if the men report for treatment within 12 hours of contact, the danger of infection is "practically nil." Protargol is preferred to argyrol for injection as being much less irritant.

Investigations in the Planting of Medicinal Herbs.

The Bureau of Plant Industry section of the Ministry of Agriculture has for a number of years experimented in cultivation and utilisation of drug plants, and noteworthy results have recently been recorded. About 80 species of drugs and herbs are now under experimental culture on heavy clay at the Government farm, where permanent plantings are being made which will furnish material now badly needed for standardising crude drugs. One important line of inquiry is the relation of special forms of culture to the development of the active principles in medicinal plants. New strains of *Atropa belladonna* and *Digitalis purpurea* have been obtained by the bureau through breeding and selection, with greatly increased alkaloidal content and this points the way to a notable improvement in the quality of certain drugs now on the market.

Quintuplets.

The *Ellenzek* describes in its issue of April 27th a case of quintuplets. Prof. Barsony, of Budapest, gives the ratio as 1 in 700,000. The case was that of a woman, aged 41, who had previously given birth to 10 children, among them being stillborn twins. She jumped from a tramcar after the latter had started, and felt something "ruptured" inside her. Typical labour-pains developed within two hours; the woman was taken from her home to the obstetrical clinic; she was four months pregnant, and had noticed that she was unusually large, but otherwise had had no discomfort; the abdomen was greatly distended, the uterus almost reaching the ensiform process. Neither the small nor the large parts of the fœtus were palpable. The os had disappeared at the time of the examination; two fœtuses were delivered within two hours. The woman had very severe pains, so that narcosis was considered, but the fœtuses were born before its induction could be begun; they weighed something over 1600 grammes together. After two weeks three other children were born, weighing about 2300 grammes. The placenta of the first two fœtuses was quite separate from the second; after the first delivery there was little hæmorrhage. After the second delivery the woman bled freely, and for two hours auto-transfusion and other life-saving measures had to be adopted. Nevertheless the puerperium was undisturbed and after three weeks the woman left the clinic as healthy as ever.

A Case of Cantharides Poisoning.

A spinster, aged 33 years, previously healthy, was taken suddenly ill with sickness and faintness, pain in the stomach, back, and intestines, and intense thirst, after taking powder made from the dried skin of cantharides, to produce miscarriage. She also confessed to having passed a catheter into the uterus and having taken very strong aperient pills containing aloes. The miscarriage took place two days afterwards, and the patient died on the fourth day of the illness. The symptoms, observed by the attending physician in the hospital, were as follows: The whole surface of the body was reddish-bronze coloured, with a dark, almost black, patch extending across the bridge of the nose on to both cheeks. The finger-tips were blue, as also the mucous surfaces of the mouth. The urine was retained, pulse 116–128, conjunctivæ tinted yellowish-brown, pupils contracted to a needle-point. From the urine, taken post-mortem, cantharidin was obtained. On her deathbed the patient confessed that she made her living by selling cantharides to women who wanted to produce miscarriage. Knowing its danger she supplied very small doses; but she herself took five times as much as she was in the habit of giving to her clients.

July 12th.

PARIS.

(FROM OUR OWN CORRESPONDENT.)

Revision of French Sanitary Law.

AT a recent meeting of the Académie de Médecine Mr. Léon Bernard, the chairman of the committee appointed to advise on the revision of the French Medical Act of 1902, read the conclusions arrived at by this committee. The report proposed that public health administration should no longer remain under the supervision of local authorities, but that sanitary regulations should be under the direct management of medical officers of health under the immediate control of the Ministry of Health. To this end it is proposed that French territory should be divided into sanitary districts under medical officers of health, these districts being grouped in sanitary regions under the control of medical sanitary inspectors. The districts are to be of small radius, so that medical officers of health should remain in close contact with the people, and, on the other hand, there are to be only a few sanitary regions, of which the heads should be medical officers of health with extensive knowledge and great technical capacity. Paris and a few large cities would retain a municipal sanitary organisation, but it would be under the control of a regional inspector. The report also recommends that communicable diseases should be reported to medical officers of health directly, this declaration being made compulsory and applying to the heads of all families concerned and to the management of various establishments. It is also proposed that revaccination against small-pox should be compulsory in the course of the seventh, thirteenth, and twentieth years. Other sanitary problems, such as the disposal of sewage and the water-supply, are dealt with; with regard to shellfish, it is pointed out that further powers are required to prevent danger to health from the consumption of shellfish which have been grown and fattened in polluted water. All the conclusions of the committee were adopted by the Academy, and it was decided that the documents should be presented to the Government, at whose request the committee was formed.

Removal and Disposal of Dry Refuse.

The removal and disposal of domestic dry refuse is one of the sanitary problems recently discussed at the Société de Médecine et de Génie Sanitaire. Mr. M. Mazerolle discussed the possibility of burning the greater part of dry refuse in destructor furnaces which could be erected in houses in the future. He pointed out the advantages of compulsory sorting of the refuse in all houses, and said that at Charlottenburg there are three receptacles in every home to collect dry refuse. Two are galvanised iron receptacles with well-fitting metallic covers, the third is a cloth bag. In the latter are placed waste paper, pieces of cardboard, broken parts of crockery; in one of the metallic receptacles are thrown kitchen refuse, and in the other ashes are placed. As far as the removal of dry refuse is concerned, Mr. Mazerolle pointed out the advantages of night collection. This would be possible in Paris where most houses consist of flats, and porters have to carry out the dustbins. He also emphasised the desirability of using covered lorries; this reform is hindered in Paris by the contracts existing between the municipal authorities and syndicates of hand-sort workers who are privileged to collect dry refuse in the several quarters.

A NEW INCOME-TAX RULE.

AT a late stage in the proceedings on the Finance Bill the Chancellor of the Exchequer moved a new clause which may be of special importance to many members of the medical profession. It relates to the proportion of the rent or annual value of the dwelling house which may be charged as a deduction in bringing out annual profits. At present the rule is that, when the same premises are used for both residential and professional purposes, there shall be charged as expenses of the practice only such part of the rent (if the doctor is a tenant) or annual value (if he is proprietor) as corresponds to the part of the premises used for professional purposes, and then the present rule proceeds —

Provided that where any such part is so used, the sum so deducted shall be such as may be determined by the Commissioners of Inland Revenue, *and shall not exceed two-thirds of the annual value or of the rent bona fide paid for the said dwelling house or offices.*

The change now made for the current year, as from April 6th last, is that the above restriction of a maximum of two-thirds is qualified as follows :—

Unless in any particular case the Commissioners are of opinion that, having regard to all the circumstances, some greater sum ought to be deducted.

It was strongly argued that many medical men were very hardly and unfairly hit by the two-thirds limit, when they were practically compelled by the nature of their practices to reside in expensive neighbourhoods, where they would never have installed themselves except for professional reasons. Thus it might easily result that to leave them domestically burdened with even one-third of the rent or annual value and rates was excessive and unfair. It is not quite clear, but it is at least maintainable, that such cases will obtain relief under the new rule. It may be said that unless the part of the house which is used for the practice represents more than two-thirds of the total annual value, no more than two-thirds can even now be passed as a deduction. But cases such as we have referred to are at least within the spirit of the new rule, and our readers would be well advised to act on that view in any case where the circumstances afford a basis for it.

Apart from these considerations two other points may be noted : 1. Where the house really serves three purposes—residence, practice, and private nursing home—the new rule will apply in terms. 2. The part devoted to the practice may not be two-thirds of the *size* of the house, and yet more than two-thirds of its annual *value*.

MEDICAL AND DENTAL TREATMENT OF SCHOOL CHILDREN.

HAVING ascertained that the total amount collected from parents during the year 1919–20 for medical and dental treatment of school children was only £4344, against a total expenditure on this work of £103,140, the London County Council has decided to vary its scale of charges. The unsatisfactoriness of the present position is accentuated by the fact that, quite apart from the actual cost of administering treatment, the mere collection of the £4344 cost the Council no less than £6225. The Education Committee of the Council is of opinion that if parents can afford to pay the full cost of treatment at the Council's centres there is no justification for charging less. At present parents are not permitted to pay the full cost, and any voluntary offer to do so has been refused. Henceforward those parents who, though unable to pay the fees of a private practitioner, are willing to pay to the Council the full cost of medical or dental treatment of their children, shall be enabled to do so.

The charges hitherto in force were 1*s.* for each period of six months for dental treatment and medical treatment of major ailments, and 3*d.* instead of 1*s.* for minor ailments. The new scale of charges to parents who do not pay the full cost is as follows :—

(1) *Minor Ailments.*—No charge for the first period of a fortnight ; thereafter 1*s.* for the first period of six months, and 1*s.* for each subsequent period of six months.

(2) *All other cases, including dental cases*, a charge of 1*s.*, so long as the index figure of the cost of living is more than 100 per cent. above the pre-war cost of living ; when the said index figure falls to 100 per cent., or less, above the pre-war cost, the charge of 1*s.* shall be increased to 2*s.* as from the first day of the month following the publication by the Ministry of Labour of the fact that the index figure has so fallen ; provided that any of the above charges may be remitted in full in respect of children whose parents have been ascertained to the satisfaction of the Children's Care (School) Committees to be necessitous.

The reason for allowing a fortnight's treatment without charge in the case of minor ailments is to ensure that small matters—trivial accidents, &c.—shall not be neglected, and that parents shall not be deterred from allowing their children to be treated. The Education Committee urges that prompt attention to minor ailments is essential, since a child's trivial complaint is frequently a symptom of something more serious.

In the course of a long debate on the Committee's proposals an attempt was made to refer the Recommendation dealing with the new scale of charges back to the Committee, on the ground that it was unreasonable to increase the charge from 1*s.* to 2*s.* when the index figure of the cost of living fell below 100 per cent. When this point was reached the wages of the workers, it was argued, would also fall, and parents would find it still more difficult to pay even the shilling now exacted. The motion was defeated.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surg. Comdr. A. La T. Darley is placed on the Retd. List at own request.

Surg. Comdr. W. B. Macleod is placed on the Retd. List with the rank of Surg. Capt.

Surg. Lieut.-Comdr. F. C. Alton withdraws with gratuity.

Surg. Lieuts. to be Surg. Lieut.-Comdrs. : J. F. M. Campbell, R. J. Inman, and R. Lyon.

ROYAL ARMY MEDICAL CORPS.

Maj. W. E. Marshall is secd. for Foreign Office service.

Capt. W. W. MacNaught retires, receiving a gratuity.

Capt. W. V. Corbett retires, receiving a gratuity, and is granted the rank of Maj.

Temp. Capt. B. H. Woodyatt relinquishes his commn. and is granted the rank of Maj.

The undermentioned relinquish their commns. and retain the rank of Capt. : Capt. S. P. Snook, on account of ill-health ; Temp. Capts. J. B. Morrison and J. MacRae.

I. Ridge-Jones, late temp. Capt., to be temp. Capt.

ARMY DENTAL CORPS.

Temp. Capt. W. M. Ferguson, Dental Surg., from Spec. List, to be Capt.

Temp. Capt. J. Marron, Dental Surg., from Spec. List, to be Lt.

Flight Lt. Lawrence Somerville-Woodiwis, from R.A.F., Dental Branch, to be Lt.

TERRITORIAL FORCE.

Maj. J. Taylor (late R.A.M.C.) to be Capt., and relinquishes the rank of Maj.

Maj. G. Dalziel (late R.A.M.C., Spec. Res.) to be Capt., and relinquishes the rank of Maj.

Capts. (late Capts., R.A.M.C.) to be Capts. : F. L. Napier, R. F. Young, J. K. Rennie, and J. O. Thomas.

Capt. M. D. Mackenzie (late R.A.M.C.) to be Lt., and relinquishes the rank of Capt.

TERRITORIAL FORCE RESERVE.

Col. Sir H. A. Ballance resigns his commn. and retains the rank of Col.

MESOPOTAMIA HONOURS.

The King has given orders for the following appointments to the Most Excellent Order of the British Empire for services in Mesopotamia :—To be Officers of the Civil Division : Mr. G. N. Braham, Surgeon Specialist, Baghdad, and Mr. A. H. Hall, Civil Surgeon, Diwaniyah. To be Members of the Civil Division : Asst. Surg. H. C. Berlie, Medical Officer, Bandar Abbas, and Miss Elizabeth Alice Emuss, Matron, Civil Officers Hospital.

Correspondence.

"Audi alteram partem."

SMALL-POX IN NOTTINGHAM.

To the Editor of THE LANCET.

SIR,—Our first case of small-pox this year occurred in February (R., Feb. 16th), and here, I think, the infection was imported from a Northern town. There was no causal relation between this case and those of the current outbreak. I am now endeavouring to construct, historically, the relation of the earlier cases of this local outbreak to one another, but the task is laborious and difficult, because at least seven of them were dealt with by their medical attendants as cases of varicella; and even now, notwithstanding fairly palpable evidence of recent small-pox in the pitted and pigmented scars on face, wrists, and hands of several of these, I have not been able to obtain much assistance in my search for them. I am inclined to think that this last outbreak of ours had origin either in the Long Eaton cases or in the sources from which these latter derived their infection—i.e., I believe, cases imported from abroad. The dates of onset in the two groups appear to fit; Long Eaton, like Nottingham, is a lace and hosiery centre; the towns are only seven miles apart and do much business together; and the communication by road and rail between the two places is very free.

The earliest cases of the current outbreak which I have been able to discover up to the present date from the first week of May. The total number of earlier cases hitherto brought to light which ran their course without a correct diagnosis is seven, but there are many reasons for thinking we have not found them all. There are 15 cases of recent origin (7 commencing last week and 5 the week before) now in the City Small-pox Hospital on Bulwell Forest. Most of the patients (all but 3) are unvaccinated, most of them have fairly severe, unmodified small-pox, but two have the milder attenuated form of which we have lately heard so much. There has been no fatality up to the present, nor, I think, is a fatal issue to be anticipated in any of those at present in our charge.

There are many cases of chicken-pox in this district, and some of these are exceptionally severe. One case which I saw with Dr. R. Heelis (of Lenton) on July 21st had an early temperature, I believe, of above 105·5°F., and although there is no difficulty for medical people with much experience of small-pox in distinguishing between severe typical examples of the two diseases, I think the severity of many of the local varicella cases explains in some measure the large number of mistakes which have recently been made by practitioners who are lacking in knowledge of the former disease.—I am, Sir, yours faithfully,

PHILIP BOOBBYER,
Medical Officer of Health.

Health Department, Guildhall, Nottingham,
July 25th, 1921.

DIGITALIS AND THE PERIPHERAL CIRCULATION.

To the Editor of THE LANCET.

SIR,—I cannot agree with Dr. W. J. Grant that I have not accurately defined the issue of this discussion. It is more correct, I think, to say that he has shifted his ground, though this is of little import.

He agrees "that an increased flow per time unit can be obtained through the arterial system in the presence of lowered blood pressure, *provided there is vaso-dilatation.*" If there is no vaso-dilatation then "the arterial passages and exits *remain as before.*" The result is that "effective *resistance* is offered . . . by the . . . undilating vessels and the intra-arterial pressure rises." Is dilatation of the vessels the only method of lowering the resistance, as your correspondent asserts? Does not a diminution of the total quantity of fluid in an "undilatable" vessel have the same effect in regard to lowering resistance as dilatation? That is precisely what takes place under digitalis. We have seen during diastole the quantity of blood is less than normal; indeed, the main conclusion of my paper is that in the whole peripheral circulation the quantity of fluid is less than normal. The statement that if there is no dilatation "the arterial passages and exits remain as before" is not correct. Your correspondent is not able to discern such a simple truth staring him in the face. We may have an increased flow per time unit in the vessels under a lower systolic pressure if the resistance is diminished. The main conclusion of my paper is that the resistance cannot be otherwise than diminished in the circumstances. It is not necessary to suspend the physical laws from operating to make my conclusions possible. All that is necessary is to suspend the blunders of your correspondent and the whole matter becomes quite plain. Had Dr. Grant thought out the problem, I do not think the controversy would have arisen, and I regret that he did not state his reasons why an increased pressure in the veins is necessary in order to obtain a rise in the intra-arterial pressure.

Once it is admitted that digitalis effects an increased output, apart from other considerations (and there are few who will dispute this) the main conclusion arrived at in my paper follows from it with mathematical certainty. The total volume of blood in the circulation is fixed; a greater output per given time means increased velocity through the peripheral circulation; since during the systole the flow of blood takes place at much greater speed than the diastole, hence the more powerful the systole the greater the velocity of the total volume of fluid. This is as obvious as the fact that an augmented output of the heart entails an increased intake. The elucidation of this fact ought to be of considerable practical value. A quicker turnover of a medium such as blood, whose function it is to provide nutriment and remove the waste products of the tissues, would not only effect an improvement in turn of the heart muscle, but also of any other organ which suffers from malnutrition, brought about by no matter what cause.

Even if the systolic pressure is not increased by digitalis, the increase in pulse pressure cannot be indifferent in cases of high degree of arterio-sclerosis. It is held by some that arterio-sclerosis, which often manifests itself at an early age in cases of aortic regurgitation (even without a history of syphilis) is due to the strain the vessels have to bear, owing to the high pulse pressure which is a usual feature of this disease. I am, Sir, yours faithfully,

Liverpool, July 25th, 1921. I. HARRIS.

THE USE OF RHUBARB IN ACUTE BACILLARY DYSENTERY.

To the Editor of THE LANCET.

SIR,—For the last three years we in Nairobi have been treating acute bacillary dysentery with powdered Turkey rhubarb root (pulv. rhei rad.). The dose is, roughly, half a teaspoonful every one, two, or three hours until the rhubarb appears in the stools. Then slacken off (the use of cachets is handy as there is less chance of vomiting). The stools will then become copious, the bad smell, mucus, and blood will disappear, so also will the colic, straining, tenderness on pressure, fever, rigors, dry tongue, fast pulse, and all the other signs and symptoms of the acute general poisoning of this disease. In children give small doses often, mixed with treacle (say, in a child of 5, give gr. v. every two hours for six hours). In them stop, after about half a dozen small doses, without waiting for the rhubarb to appear in the stools, as in some children there is apparently a sudden accumulative effect and then the most obstinate diarrhœa may follow, although the dysentery is cured. In adults the rhubarb will usually appear in the stools within six hours—in children very much longer—so

much so that I often give some other drug afterwards to carry it along quickly. In both adults and children give lots of sod. bicarb. and potass. citrat., alternately, in plenty of water. This is most important, especially in children, as there is always great acidosis. I know of no remedy in medicine which has such a magical effect. No one who has ever used rhubarb would dream of using anything else. I hope others will try it in this dreadful tropical scourge.

I am, Sir, yours faithfully,

Nairobi, B.E.A., June 24th, 1921. R. W. BURKITT.

Obituary.

ARTHUR CHARLES OLDHAM, F.R.C.S. EDIN., MAJOR, R.A.M.C. (T.).

To those who knew him the news that Arthur Charles Oldham had died of sunstroke on July 21st in the neighbourhood of the Persian Gulf came as a real blow. About a year and a half ago he accepted a medical appointment at Baghdad under the War Office, and despite his having passed the age of 50, he seemed to be standing well the trial of his patriotic action. "'A.C.O.,' as he was affectionately known to his friends," writes one of them, "came of a distinguished family which is honoured in science in this country and many parts of the world. In early youth he had none of the usual advantages and was compelled to rely entirely on his own resources and efforts. Happily he was blessed with an excellent memory and a capacity to take pains with everything he undertook. He studied at Owens College, Manchester, and at the Royal College of Surgeons, Ireland, and at the latter institution in 1894 he was awarded the medals for medicine and surgery. Eventually settling in Kidderminster he obtained a large and widely extended practice. Possessing marked surgical ability and skill in diagnosis, he endeared himself to his patients of all classes. No trouble was too much for him to take, be the sufferer well-to-do or the poorest of the poor. Could any testimony be higher! As in his work so in leisure moments Oldham was a keen sportsman, a golfer above the average, and an enthusiastic student of good music and fine arts. As a Territorial officer of some standing he went on active service in August, 1914, and served throughout the war in England and France, latterly as specialist in venereal diseases.

"Being over 50 many friends regretted his decision to go out to the East, but all that knew him were certain that no risk would deter him from doing his duty. He has played his last round for his country, and it is certain he played it well to the end. Though he lies at rest 'somewhere East of Suez' the memory of an affectionate brother and kind-hearted friend will be kept green for many a long day in the hearts of those he was loved by."

ST. THOMAS'S HOSPITAL ANNUAL DINNER.—The annual Old Students' Dinner will be held on Friday, Oct. 28th, at the Wharncliffe Rooms, Hotel Great Central, Dr. H. W. G. Mackenzie in the chair. The usual notices will be sent out early in October.

UNIVERSITY OF BRISTOL APPEAL.—The University of Bristol has at length issued the appeal for adequate endowment, long deferred on account of the coal strike, in the form of a pamphlet, backed by posters displayed throughout the city. The argument of the pamphlet is that Bristol has been generous in the provision of University buildings, and that to make these effective a large increase of capital is necessary to provide for the expenses of maintenance. There is a debt of £70,000 on which interest is being paid. The sum asked for is £1,000,000, which in the opinion of the financial advisers of the University is by no means unattainable. In a list of chairs as yet without endowment are included those of Anatomy, Pathology, Medicine, Surgery, and Obstetric Medicine (the three last, indeed, are not only without endowment but almost without stipend), while that of Physiology is only partially endowed. It is clear, therefore, that if it is to continue to exist the Faculty of Medicine alone must absorb a large portion of the sum now being asked for.

Medical News.

UNIVERSITY OF LONDON.—A meeting of the Senate of the University was held on July 20th, the Vice-Chancellor, Sir Sydney Russell-Wells, in the chair. Dr. F. S. Langmead was appointed, as from August 31st, 1921, to the University Chair of Medicine tenable at St. Mary's Hospital Medical School. The Rogers Prize of £100 for 1921 was awarded to Mr. Lambert Rogers, M.R.C.S., L.R.C.P., for an essay entitled "The Surgical Treatment of Hyperthyroidism." The committee of the medical members of the Senate have elected Mr. H. J. Waring to be their chairman for the year 1921–22.

At examinations held recently the following candidates were successful in the subjects indicated:—

M.D. EXAMINATION.

Branch I., Medicine.—Simon C. de Silva Wijeyeratne, Univ. Coll. Hosp.; Geoffrey B. Dowling, Guy's Hosp.; William Feldman, Philip Hudson, and William A. E. Karunaratne, Univ. Coll. Hosp.; Gerald M. J. Slot (University Medal), St. Bart.'s Hosp.; John Heatly Spencer (obtained the number of marks qualifying for the University Medal), Charing Cross Hosp.; John G. Wardrop, Univ. Coll. Hosp.; Alfred Williams-Walker, Birmingham University; and Alfred Wills, Guy's Hosp.

Branch IV., Midwifery and Diseases of Women.—Kathleen M. Cogan, London Sch. of Med. for Women and St. Mary's Hosp.; Maud Gazdar, London Sch. of Med. for Women; Dennis H. Geffen, Univ. Coll. Hosp.; and Hilda G. Johnson and Muriel E. Landau, London Sch. of Med. for Women.

Branch V., State Medicine.—Lena C. Adam, London Sch. of Med. for Women and Univ. Coll. Hosp.; Hugh M. C. Macaulay, St. Bart.'s and Univ. Coll. Hosps.; Arthur B. Porteous, St. Mary's Hosp.; Rowan W. Revell, Middlesex and Univ. Coll. Hosps.; and Percy S. Selwyn-Clarke, St. Bart.'s Hosp.

Branch VI., Tropical Medicine.—James Fanstone, London Hosp. and London Sch. of Trop. Med.; and Clement H. Heppenstall, Leeds University.

M.S. EXAMINATION.

Branch I., Surgery.—Arthur L. Abel, Univ. Coll. Hosp.; Arthur W. Adams, Bristol University and London Hosp.; John A. W. Ebden, Westminster and London Hosps.; Claude H. S. Frankau (University Medal), St. George's Hosp.; Robert J. McNeill Love, London Hosp.; and Henry W. S. Wright, Univ. Coll. Hosp.

UNIVERSITY OF WALES: NEW PROFESSOR OF MEDICINE.—Dr. A. M. Kennedy, of the University of Glasgow, has been appointed Professor of Medicine in the Welsh National School of Medicine, Cardiff (University of Wales). Dr. Kennedy, who is at present senior assistant to the Muirhead Professor of Medicine in Glasgow University and one of the assistant physicians to the Glasgow Royal Infirmary, acts as Director of the Research Department at the Glasgow Royal Maternity and Women's Hospital on behalf of the Medical Research Council. He is the joint author of a monograph on cerebro-spinal fever and has contributed numerous papers to medical journals. He takes up his duties as Professor of Medicine and Director of the Medical Unit at Cardiff on Oct. 1st.

UNIVERSITY OF EDINBURGH.—At the graduation ceremonial in medicine, held in the M'Ewan Hall, Edinburgh, on July 15th, the following degrees were awarded:—

DOCTOR OF MEDICINE.

George A. Borthwick, Thomas L. Clark, *Thomas M. Davie (in absentiâ), Alfred V. Dill (first-class honours), †François P. Fouché, ‡Joseph G. Greenfield (first-class honours), *Robert L. Impey, James P. P. Inglis, Norman S. R. Lorraine, †Henry M. Moir, Bangalore Pasupulati Balakrishna Naidu, *Robert H. H. Newton, Pieter Johannes Olivier, Alexander C. Renwick (in absentiâ), William Gwernwy Richards, †William Stobie (in absentiâ), †John J. Thomson (first-class honours), and †Gerald G. Wray.

* Highly commended for thesis. † Commended for thesis.
‡ Awarded Gold Medal for thesis.

MASTER IN SURGERY.

David Holmes.

BACHELOR OF MEDICINE AND BACHELOR OF SURGERY.

James B. Aitken (second-class honours), George J. Alexander, Sydney E. Ammon, Thomas F. Andrew (in absentiâ), Flora T. F. Angler, Gilbert R. A. Armstrong, Charles W. Badger, Frederick E. L. Beck, Rosa M. Bickerton, John M. Black, Jacobus M. Bosman, William H. S. Boyd, Maeve Cluna Brereton, Andrew S. Burns, Donald Ian Cameron, John Campbell, Eric E. Candlish, Edward A. Carmichael, Edith K. Chandler, James H. Clarke, Jessie M'Crirrie Craig (second-class honours), Nicholas S. Craig, Edward J. Crarer, Grace Cumming, Edward Douglas Dingle (second-class honours), William Douglas, Alexander Dower, Stephanos J. Eapen, Geoffrey D. English, Harry D. Epstein, Isobel M. Finlayson (first-class honours), Edward M. Fraser, John S. Fulton, Katharine M'Laren Gifford, Elspeth L. Gilmour, Mary

H. M. Gordon, Oliver Gray, Helen Gregory, Adele Haggart, Arnold A. Hamilton, Mary I. Hemingway, Henry Hodgson, Nöel R. H. Holmes, Helen R. T. Hood, Richard Howarth, John W. A. Hunter (second-class honours), Jean François van Iddekinge, Frederick T. Ingram, Victor W. Jack, Edward S. Jackson, John Dorrens Johnston (second-class honours), Philip R. Kemp, Frans Krone, John R. Larson, Laura M. Ligertwood, James Ireland M'Caa (second-class honours), Alexander G. M'Clellan, Eliza W. M'Crae, Angus Macdonald, Agnes B. MacGregor, Robert G. M'Intyre (first-class honours), Arthur G. Mackay, Donald E. Malone, Dorothea J. Mann, Margaret B. Martin (second-class honours), Nancy Martland, Aymer D. Maxwell, Isabella M. Mears (second-class honours), Paul S. Meiring, Charles E. Meryon, Mary Middlemass, Catherine A. J. Mitchell, Ruth M. Monro (second-class honours), David M. Morison, Helen S. E. Murray, Jean Murray, Priya Nath Nag, Charles S. Nimmo, Marjorie Norris, Owolabi Anifoshe Omololu, Carrick G. Payton, Chepad Sangar Govinda Pillai, Janetta J. Powrie, Mary E. Price, Margaret M. Proudfoot, Margaret T. Rutherford, Marjorie E. F. Sanders, Charles E. Scott, Hilda D. Scott, James Sharp, Louis Siff, Gysbertus Johannes Smit, Moray Taylor Smith, Horatio W. J. Steen, Charles Stewart, James D. Stewart, Jenny R. Tait, Richard J. O. Taylor, Evan K. R. Thomas, Hugh B. Thomson, Sophia M R. Thomson, Philip H. J. Turton, John Veitch, John H. Verwey, Thomas J. M. Walker, David C. Wilson, Edward A. Wilson, Isabel G. H. Wilson, and Hassan Zaifol (in absentiâ).

DIPLOMA IN PUBLIC HEALTH.

Harry Alexander, Alexander F. Campbell, Marjorie H. King (in absentiâ), Anne L. MacDonald, Jane C. MacDonald, Annie S. MacLeod, Henry J. Parish, Austin Priestman, Annie M. Roxburgh, George M. S. Smith, and Mabel Thomson.

The following awards were also made :—*Faculty of Medicine.*—Thesis Gold Medal: Joseph G. Greenfield. Cameron Prize in Practical Therapeutics: Jules Jean Baptiste Vincent Bordet. Goodsir Memorial Fellowship: Robert Kho Seng Lim. Straits Settlements Gold Medal: Francis H. Stewart. Gunning Victoria Jubilee Prize in Medicine: Robert L. Impey. Gunning Victoria Jubilee Prize in Anatomy: Claude W. Stump. Ettles Scholarship and Leslie Gold Medal: Alexander L. M'Gregor. Allan Fellowship in Clinical Medicine and Clinical Surgery: James I. M'Caa. Murchison Memorial Scholarship in Clinical Medicine: Jessie M'Crirle Craig. M'Cosh Graduate's and Medical Bursaries: Edward A. Wilson. Beaney Prize in Anatomy and Surgery: Alexander L. M'Gregor. Mouat Scholarship in the Practice of Physic: Robert G. M'Intyre. Conan Doyle Prize: Alexander L. M'Gregor. Annandale Gold Medal in Clinical Surgery: Edward A. Carmichael. Buchanan Scholarship in Gynecology: George J. Alexander. James Scott Scholarship in Midwifery: Isobel M. Finlayson. Scottish Association for Medical Education of Women Prize: Isobel M. Finlayson. Dorothy Gilfillan Memorial Prize: Jessie M'Crirle Craig. Wellcome Medals in the History of Medicine: Gold Medal, James M. Anderson; Silver Medal, Thomas Ferguson. Pattison Prize in Clinical Surgery: Donald S. Middleton and Arthur J. Wilson (equal). Wightman Prize in Clinical Medicine: Arthur J. Wilson. Cunningham Memorial Medal and Prize in Anatomy: Donald G. S. M'Lachlan. Whiteside Bruce Bursary: Donald Mainland.

UNIVERSITY OF ABERDEEN.—The summer graduation ceremony was held on July 14th, when the following degrees were conferred :—

DOCTOR OF MEDICINE.

*John Kirton, *George F. Mitchell, and Alexander J. Will.

*Commendation for Thesis.

BACHELOR OF MEDICINE AND BACHELOR OF SURGERY.

*Cuthbert A. Allan, Allan B. Clark, Robert Dawson, Douglas R. Dugan, Frances M. Duguid, Lewis I. Duncan, Margaret F. Fraser, Barbara M. Geddes, James W. Gill, Ethel E. Gray, Charles Joiner, Patricia Henderson Low or Cassie, *Elsie J. Mann (second-class honours), *Max Mindé, Frederic H. Mollière, Ronald M. Savege, Elsie J. Scorgie, Jenny H. A. Simpson, Frances M. G. Sinclair, †Annie Thain (first-class honours), *George Otto Thornton (second-class honours), Elizabeth M. Walker, Nora I. Wattie, and Fred Wilson.

* Completed Final Professional Examination with distinction.
† Completed Final Professional Examination with much distinction.

The John Murray Medal and Scholarship and the Lyon Prize were awarded to Annie Thain.

DIPLOMA IN PUBLIC HEALTH.

Emily M. Badenoch, Charles A. Harvey, Frederic D. R. Keyt, Winifred M. A. Kindness, Mathilda F. Menzies, and Daniel I. Walker.

ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH, ROYAL COLLEGE OF SURGEONS OF EDINBURGH, AND ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW.—The following candidates have passed the Triple Qualification Examination :—

THIRD EXAMINATION.

James M. Crombie, Matthew Burn, Andrew A. Dewar, Helen J. Hamilton, John J. Mann, George F. Maher, Robert P. Anderson, Thomas P. Bremner, William Paris, Thomas E. Mathias, Charles W. de Villiers-Pritchard, William H. Griffith, Israel Rostowsky, Albert R. Rellum, Richard F. Kerr, and Elizabeth Clark.

Pathology.—David R. Paterson, Wilhelmina C. Storrie, Herbert Chorley, Johannes Jacobus Malan, and Owain ap Vychan Jones.

Materia Medica.—Montague A. Watson, Leonard A. Watson, Donald Jack, Jemima M. McKendrick, Charles C. Robson, George H. Tarras, Edward T. Hume, David Isaacs, Douglas M. Beaton, Samuel I. T. Wills, James H. Murrell, and Alexander L. Tinto.

FINAL EXAMINATION.

William B. Stott, Edward S. Godlieb, Otho P. Fox, John H. Bain, Vincent H. L. Anthonisz, Robert E. O'Keeffe, James S. A. Rogers, Ram Nath Nanda, Abdus Shakur, Hubert E. C. Cezair, James Pedris, Alexander G. Thom, Aflatun Yacub Khan, Emanuel J. Swirsky, James McNie Campbell, David M. Scrimgeour, Reuben Abramsky, Jane Copes, Eric W. Johnson, John Connal, John K. Holmes, Herbert Brown, Alan W. Hart, Hugh McKerlie, Gwilym ap Vychan Jones, and Elliot P. Dewar.

Medicine.—Lionel R. Bergson, Frank Walwyn, Herbert W. Amyes, Robert R. Waters, Albert R. Rellum, Henry P. Samuel, and Vadakath Padmanabha Menon.

Surgery.—Jatindra Kumar Sen, Herbert W. Amyes, Leo H. Peries, John Hagard, and Vadakath Padmanabha Menon.

Midwifery.—John G. Collee, Frank Walwyn, Robert R. Waters, Henry P. Samuel, and John Hagard.

Medical Jurisprudence.—Robert W. P. Hall, Gabriel G. King, Ian B. Cummings, Alexander W. Buchan, James B. Hendry, James S. Allan, John M. Cockburn, William L. Murray, Henry G. F. Cubitt, Herbert W. Amyes, Andrus M. Samarasinghe, Salomon Asam Ho Asjoe, Arthur S. Wickremesinghe, Frederick P. Lisboa-Pinto, Albert R. Rellum, and Jemima M. McKechnie Calder.

ROYAL COLLEGE OF SURGEONS OF EDINBURGH.—*Presentation of Portrait of Lord Lister.*—At an extraordinary meeting of the College, Dr. George Mackay, the President, presented to the College a portrait of the late Lord Lister. The picture is a full-sized copy made by Mr. Dorfield Hardy of the portrait painted by W. W. Ouless, R. A., in the possession of the Royal College of Surgeons of England. In accepting the portrait on behalf of the College, Dr. McKenzie Johnston, the Vice-President, expressed the satisfaction the College had in acquiring this memorial of its most distinguished Fellow through the generosity of their President. Lord Lister entered upon his great surgical career as house surgeon to Prof. Syme in the old Royal Infirmary of Edinburgh. Later he acted as a lecturer on surgery in the extra-mural school in connexion with the Surgeons' Hall and as assistant surgeon to the Royal Infirmary, and subsequently he succeeded Syme in the chair of Clinical Surgery in the University. He became a Fellow of the College in 1855, and on the occasion of the celebration of the fourth centenary of the College in 1905 was elected an Honorary Fellow.

At a meeting of the College held on July 19th the following successful candidates, who passed the requisite examinations between March 21st and 25th, were admitted Fellows:

Alfred D. E. Bayliss, Keith P. Brown, Robert S. J. Fitzgerald, Andrew Fowler, William J. Grant, Daniel F. Hegarty, Archibald Langwill, John J. Liston, James S. Robinson, John J. McIntosh Shaw, Richard W. Smith, Quintin Stewart, William R. Stewart, and Peter P. Wright.

GENERAL INFIRMARY AT LEEDS.—Changes in the chairmanship of the infirmary have not been of frequent occurrence. Mr. Benson Jowitt held this office for 20 years, and his successor, Mr. Charles Lupton, has just retired also at the end of 20 years' service. Mr. Lupton's term of office will long be remembered by the public of Leeds and especially by the members of the honorary staff of the institution. Under his care and direction many improvements have been carried out. Among these may be mentioned the extension which has just been completed, in memory of the late King Edward. The Prince of Wales had expressed his intention of spending some time during his visit to the Yorkshire Agricultural Show in inspecting the infirmary, and had consented to open the extension; the postponement of his visit is only a less reason for regret than its cause. The extension comprised a new out-patient department, a new suite of general and of special operating theatres, and a new ward-pavilion, which have for some months been in full occupation. The question of accommodation for children had to be considered; there has never been any separate hospital for children in Leeds, and three of the large wards are to be allocated for the reception of children. Apart from the cots for children in these wards and in the semi-open-air ward which is to be provided on the terrace—which will together provide accommodation for about 120 children—it was found that there would be in the infirmary 432 beds for adults. The numbers allotted to the various departments will be as follows:—Medical, 113 (66 male and 47 female); surgical, 206 (135 male and 71 female); ophthalmic, 44 (27 male and 17 female); aural, 26 (14 male and 12 female); gynæcological, 23; isolation

cases, 16 (8 of each sex), and four emergency beds, which will be used for the temporary detention of those who come in under the influence of drink; this allotment of beds expresses in part the proportion which has existed in the past, in part the endeavour to provide a greater number of medical beds, and in part the consideration given to proper segregation of medical and surgical cases, convenience of nursing, and relation to the operating departments. The growth of the honorary staff since the infirmary was opened in 1868 by King Edward the Seventh (then Prince of Wales) is of some interest. At that time there were three honorary physicians and four honorary surgeons. The staff now numbers three physicians, three assistant physicians, four surgeons, four assistant surgeons, two ophthalmic and two aural surgeons, an obstetric surgeon and the honorary pathologist who is appointed by the special election committee, but who has to have the qualification that he is the professor of pathology in the University. In addition to these 20, there are the two officers in charge of the radiological department and the officer in charge of the venereal department, all of whom are appointed by the board on the recommendation of the faculty for a period of five years, and who are all eligible for re-election. In 1883 the resident staff numbered 7; there are now 14. The re-allocation of beds and cots above detailed is already being given effect to, but until the end of this year it will not have been fully carried out, and it will be some time before the open-air accommodation for children can be provided; when the process is completed the infirmary will have within its walls at least 552 beds and cots. In addition to these, the 88 beds at the two semi-convalescent hospitals at Cookridge really form an extension of the ward accommodation; to them are sent patients who require more nursing and attention than can be given at ordinary convalescent institutions. The maintenance of this great hospital makes heavy demands on the generosity of the public of Leeds and the surrounding district, and its finances are a source of anxiety to the board of management, but it is clear that the reputation of the infirmary has never stood higher than at present. Though Mr. Lupton has retired from the position of chairman he retains his seat on the board. He is succeeded by Mr. T. L. Taylor, who is not only a large employer of labour and a well-known business man, but a well-known cricketer, and will command the respect and confidence of all classes of the community.

ST. GEORGE'S HOSPITAL MEDICAL SCHOOL.—The annual dinner will be held on Oct. 1st at Oddenino's Restaurant with Dr. H. A. Des Vœux in the chair. The usual notices will be sent during August.

BRITISH HOSPITALS ASSOCIATION LUNCHEON.—On July 30th, at the Royal Automobile Club, Lord Cave and the members of the Voluntary Hospitals Committee were entertained to luncheon by the British Hospitals Association. The Chairman (Sir Arthur Stanley) proposed the health of the guests, and expressed the gratitude of the Association to the Committee for the work done on behalf of the voluntary hospitals. Their double duty—the inquiry into the nature and extent of the difficulties with which the hospitals were faced and the suggestion of a way out of those difficulties—had been performed in a remarkably efficient way. Given a little time, the voluntary system could reassert itself and become as successful as it was in the past. Mr. Wade Deacon, supporting the toast, said that everyone connected with the voluntary hospitals appreciated the great trouble taken by the Committee in their work; as one who gave evidence before it he knew the shrewd interest and kindness displayed by its members. Viscount Hambledon spoke on behalf of the London hospitals; the latter, he said, had a problem of their own to solve; he hoped that before long increased receipts would remedy the urgent need now evident, and permit action along the lines recommended by Lord Cave's Committee. Lord Cave, responding, referred to the cordial support the Committee had received from all those interested in and connected with hospital work and from the Ministry of Health. With reference to the Government's grant of half a million pounds in answer to the Committee's urgent recommendation of a grant of a million this year and a possible million next year, if the hospitals had again to appeal for help in a year's time it would not be the fault of the Committee. If 1 per cent. of business profits in the country were applied to hospital purposes there would be no hospital problem. It was necessary that some fund for provincial hospitals, similar to King Edward's Hospital Fund for London, be established; and if hospitals were to prosper they must work more together than they had done in the past. The Marquess of Linlithgow then proposed the health of the Chairman; Sir Arthur Stanley, replying, made special mention of the valuable services rendered to Lord Cave's Committee by its secretary, Mr. L. G. Brock, who was now secretary of Lord Onslow's Commission.

Parliamentary Intelligence.

HOUSE OF LORDS.

WEDNESDAY, JULY 20TH.

Hospital Finance.

Viscount BURNHAM asked His Majesty's Government whether they had fully considered the Report of Lord Cave's Committee on hospital finance, and, if so, what further steps they would take to put the system of voluntary hospitals on a more satisfactory footing, particularly in relation to the Poor-law infirmaries. He said he asked the question not in antagonism to the Committee presided over by Lord Cave, to whom the whole hospital world was much indebted for the care that he had taken in the preparation of the Report. But that Report was of necessity provisional, and the remedies suggested were in the nature of a stop-gap. The London Hospital had closed down 200 beds and King's College Hospital 100 beds. On the other hand, this was only one phase of what had been called the national health problem, and the hospitals were only part of the national health policy. That things were not as they might be they could see well enough when in the Report of the Chief Medical Officer of the Ministry of Health it was stated that in England and Wales there was lost to the nation every year among the insured population only, and excluding losses due to sickness for which sickness and disablement payment was not payable, the equivalent of the work of 270,000 persons. There was a clear case for the renewal of the mandate of this Committee and for the extension of its reference. What had been done now would not do much more than cover the year's deficit; and yet the causes lay so deep that unless the problem was considered as a whole, and now, the waste of public money would be great, and the results were not likely to be satisfactory. All who were connected with the administration of voluntary hospitals were pleased that the Committee emphatically affirmed and approved the voluntary principle. Experts speaking at various conferences believed that it created a free and expansive atmosphere for medical research and medical treatment, and that if State or even municipal control were substituted it would crab and stereotype the methods of administration and be fatal to scientific advance as well as to expert treatment.

Hospitals and National Health Insurance.

There was, Lord Burnham went on to say, a clear case for asking the Committee to report on two great subjects long overdue. He meant the relation that the system of national health insurance bore to the rest of the problem of national health, and particularly to the provision of hospitals, both general and special; and secondly, the relation of the Poor-law infirmaries to the voluntary hospitals. In regard to insurance, he thought that the Committee had much understated the case. It was recognised in the Act of 1911 that hospital treatment was necessary as part of the general relief given to insured persons, many of whom were well within the category of the sick poor. The Committee did not appreciate the degree to which the obligations and the burdens of hospitals had been increased by the National Insurance Act. Hospital treatment was absolutely necessary to the obtaining of satisfactory results under that Act. It was not the case that the general practitioners had given all that the Act demanded, or all that they might have given, if it had not been for the goodwill and the zealous assistance of the hospital authorities. Before the Act was passed a vast amount of sickness and distress was hidden in the back streets of the great cities and never brought to light. Much of it in the country villages never obtained proper attendance, still less remedial treatment. When the panel practitioners began to appreciate the extent of their duties they found ready to their hand, and especially in the metropolitan area, a great system of voluntary hospitals to which they could turn if they were in the least difficulty; and there grew up the practice of sending their patients to hospital with letters of recommendation, which, as a rule, insured the cases being dealt with, even when they were not of great urgency. The whole system of prophylactic treatment was only slowly appreciated. The Exchequer was getting indirectly the benefit of a vast amount of hospital expenditure which would have been unnecessary if the National Insurance Act had not been passed. The calls upon the hospitals were increasing. The expert consultants were now going into a sphere of treatment which was formerly left to the general practitioner, and as disease was diagnosed with greater fullness and accuracy so the demand for skilled treatment was always increasing. A clear case existed under the Act for obtaining a contribution ut of the surpluses of the Approved Societies such as might

not be possible at present without an amendment of the law. He could not believe that when the changed conditions of medical and surgical treatment were considered the Ministry of Health would be satisfied to leave the hospitals without a large contribution from the great surpluses now being accumulated, and which had already been accumulated by the Societies. During the war the vast bulk of the people, and especially those who enlisted in the forces, came to demand a higher standard of medical treatment, and received it. They were not willing to revert to the old order, and were not satisfied now merely with the panel doctor, not at his best, but at his worst. They frequented the out-patient departments of the hospitals in greater numbers than they did, and even though in some cases they had to pay a small fee the insurance fund had benefited materially by the lessons of the war.

Hospitals as Training Schools.

It was forgotten sometimes that at least the 12 general hospitals in the London area, which had schools attached, were doing a great deal of work which was in no sense confined to the sick poor either in their own area or even within the bounds of the metropolis. They were the training schools for the medical profession of the whole Empire. At Cambridge University, for example, they could not in the medical school there fully equip a man for the practice of medicine, because although theory could be taught, it was obvious that they had not the pathological material for the purpose. It was left to the hospitals to take upon themselves the whole of the medical research, which was increasing in importance every day. That was a matter not only of national but of imperial importance. It was freely stated and claimed that the voluntary system of our hospitals had enabled medical skill and genius to be developed so far and so fast that in those matters we were ahead of the rest of the world. If that was true it was mainly because the 12 great general hospitals of London, with others in Edinburgh and one or two of the great cities, had carried out this urgent research and experiment, and they were doing it, of course, at the expense and by the goodwill of those who subscribed to their funds. The equipment of the general practitioner throughout the country was being raised year by year by the experience of what was being done in the hospitals and by the knowledge that was imparted to him, directly thus or indirectly through the medical journals, and there was a clear case on that ground—that the hospitals should receive fair payment out of the great surpluses of the Approved Societies.

Relation of Poor-law to Voluntary Hospitals.

The second point on which he asked for further investigation was the relation of the Poor-law institutions to the voluntary hospitals. If nothing more was done, and things were left until there could be a general reform of the Poor-law system—a revolution of our local administration, for that was what it meant—he thought they would have to wait a long day before any proper system of connexion or relation between the Poor-law institution and the voluntary hospital was brought about. A good deal of money for building and development might not be required if they were able to put the Poor-law infirmaries in their proper place as part of the general system of medical relief, not only in London, but elsewhere. There were 90,000 beds in the Poor-law infirmaries of the country and 20,000 in London alone. In 1920 the total number of beds in the voluntary hospitals in Great Britain was 52,194. Half of the beds in the Poor-law infirmaries were not full; half of them were never used in the year. Even when they were used there were not the consultants or the experts available as there used to be in the old days when the pauper cases were dealt with in the general hospitals. They were not available for the graver sorts of disease and major operations. The equipment was often quite inadequate for the general range of hospital work. He was sure that there could be such a coördination of activities and of capacities in regard to the care and cure of the sick poor as would set the whole system in order and prevent a large waste of public money, such as was inevitable now. If the law were so amended that they could concentrate the cases of paupers (if the Poor-law still continued its nomenclature) in a certain number of Poor-law institutions, and made the others available for the general purposes of treatment and relief, that in itself would be a great gain.

Administration of the Government Grant.

The Earl of ONSLOW (Parliamentary Secretary of the Ministry of Health) expressed the thanks of the Government to Lord Cave and his Committee for the useful and valuable suggestions contained in their Report. The British Medical Association, meeting in Newcastle, had just endorsed the recommendation that the voluntary system should be maintained. The Government most cordially agreed with that view. The noble earl went on to describe the Government scheme for carrying out the recommendations of Lord Cave's Committee, as set forth in a White Paper recently issued by the Ministry of Health. The Minister he said, had adhered to the recommendations of the Committee with regard to the constitution of the Commission appointed to administer the Government grant of £500,000 with one exception—namely, that he had added one more member to represent Wales, and he was glad to say that Lord Clwyd had accepted the position of representative of Wales on the Commission. They were hoping to get the most representative local committees they possibly could, representative of those in touch with the voluntary hospitals in any way, of the medical profession, of the hospital boards of management, of employers, of employed, of local authorities, and of women. The Government had decided that they ought not to contribute towards building schemes at present, when the hospitals were not paying their way, and the cost of building was steadily falling. In the present financial condition of the country the Government must be content to contribute only £500,000 in aid of the deficit, and rely upon the public to provide the rest. The duties of the Commission would be to deal with the situation at once, and make such advances from the fund as would enable hospitals to carry on, at any rate for the present, and relieve their most immediate wants. It was proposed that King Edward's Fund should take the place occupied by local committees in the provinces, and act as the local committee for London. The Commission and the local committees were in no way intended to exercise control over the hospitals. They were there rather to help the hospitals to rise on their legs again. The sole intention was to administer the Government grant so that the necessity for it should disappear quickly. The whole question of hospital areas and the sufficiency of beds in those areas would be a matter for the Commission and the local committees. With regard to Poor-law infirmaries there were 92,000 beds in those institutions, but they were not all in separate infirmaries; many of them were attached to workhouses. An average of 20,000 beds in them were vacant during the winter, and 30,000 in the summer. There were 36,607 beds in separate infirmaries, and on January 1st last 9150 were vacant. He did not know that they were all suitable beds, but, at any rate, they were there, and it was quite possible that the accommodation in these infirmaries might be of very great value and assistance in relieving the hospitals. The matter would be carefully investigated, and he would be disinclined to press the Commission to ask the local committees to submit proposals until they had had every opportunity of considering the matter fully and adequately, and with special regard to the resources of their areas. With regard to the question of contributions by the approved societies, it would be premature for him to say anything definite at the present moment. But the point would receive the most careful consideration, as would all matters which would tend to relieve the situation and to assist the hospitals.

Lord SOMERLEYTON, as one connected with the Central Fund for Hospitals in London, said it was quite clear that the central authority for London would obviously have to take into consideration the fact that the Poor-law infirmaries were now more available for the use of hospitals than they were at the time when plans for extensions and alterations were originally put forward. This consideration would therefore require, and would no doubt receive, the most careful attention of the central authority for London.

A Wider View of Hospital Needs.

Lord DAWSON of PENN said that when the Committee's recommendation of a grant of £1,000,000 for the hospitals was reduced by half they all realised that the Government had only made that reduction under the cogent pressure of financial difficulties. But, in view of that fact, he asked whether it would not be wise to reconsider the basis of its distribution. The sum of £500,000 when divided amounted to very little in an individual case. It was an important matter to put the teaching hospitals of the country into an entirely different schedule. If anything interfered with the efficiency of the teaching hospitals the whole nation suffered, because they provided not only the doctors and the nurses for the coming generation, but they set the standard of work. As a consequence the standard of work throughout the whole country could easily be so lowered in a short space of time as to deteriorate medicine in this country for 20 years. The question of the Poor-law infirmaries should not be allowed to rest longer. While they were waiting for that spare time which never came to Governments, in order to solve the Poor-law question, the country was prevented from utilising to the extent that it could the resources of Poor-law institutions. Lord Burnham had referred to the sick poor. That was not a wide enough view to take. The public were all poor now, and many of them were sick. The number who required institutional treatment steadily increased year by year, and

was going to increase, and any estimates which the noble earl might make as to the necessity of institutional treatment would be very much under the mark. The whole tendency of modern life was to increase the need of institutional treatment. The diagnosis of disease was no longer the work of a single individual; it was done by the coöperation of several individuals; and coöperation required equipment and organisation, and these required provision. That was the scientific reason; the next was the economic reason. Every time they increased complexity in the investigation of illness they increased the cost. Every new invention cost an institution an increase in expenditure. This meant that the number of people who could defray the whole cost of their illness went steadily down. The only solution was an increased provision of institutional treatment. The third was the social reason. Homes were now much more difficult to manage than they were, and the more narrow and restricted the income the greater the difficulty. In some parts of the country, if the lady of the house ventured to wish to have a baby, the servants very often desired to leave. They must take a wider view of hospital needs than that represented by the case of the sick poor.

The Place of Poor-law Hospitals.

One way by which the Poor-law infirmaries could be used in certain districts was by supplementing the work of the general hospitals by arrangement; but they should not start business on their own, as had been done at Bradford. The medical talent of a district nearly always centred round the voluntary hospital, which enabled that hospital to give a lead in treatment and medical policy. Another way in which Poor-law infirmaries could by voluntary means assist the community was by setting aside wings or blocks of beds for paying patients or supported by paying patients. But it was necessary that the boards of guardians, or the body that had charge of these infirmaries, should make no provision for the medical care of these people. All they should do was to provide the hotel part of the business, and the nursing equipment and machinery. The patient's own doctor should follow the patient into that institution, and in that way they would support the central principle of all medical progress in this country, and that was the provision of the fabric side by side with freedom of relations between doctor and patient. If once they allowed the guardians to provide medical aid for these patients they were on the slippery slope of municipalisation of medicine. Although the country was in dire need and straitened financial circumstances it would be helpful if the Ministry of Health could lay down the outlines of a health policy. What was the policy that was going to guide these services, and especially the curative services, during these lean years when it was admitted that expenditure must be cut down to the minimum? He suggested that there were two lines of policy—first, to maintain all essential services now, not more than that; and then this further line of policy: they could utilise these lean years to lay down the foundations of a constructive policy which could be commenced when the finances of the country permitted an advance in that direction.

Viscount CAVE said that the House had been more than interested in Lord Dawson's speech. He was sure that the insurance societies owed a great deal both pecuniarily and otherwise to the hospitals, and he hoped they would recognise that help by making larger contributions to their funds. If it were necessary, as he thought it might be, to modify the law, in order to enable full coöperation to take place between the Poor-law infirmaries and the voluntary hospitals, he hoped the Government would introduce a Bill for that purpose without waiting for the introduction of the general measure which had been foreshadowed.

HOUSE OF COMMONS.

TUESDAY, JULY 19TH.

Death Certificates.

Mr. WATERSON asked the Minister of Health how many deaths were certified by registered practitioners in each year during the past ten years; how many deaths were uncertified, and how many of the latter deaths were reported to coroners.—Sir A. MOND replied: It is not possible to state the number of deaths which were certified by a registered medical practitioner or the number of those which were not so certified. The available statistics are derived from death registration; and a death which is the subject of an inquest is registered on the certificate of the coroner, whether it had or had not been previously certified by a registered medical practitioner. The figures of deaths registered respectively on the certificate of a registered medical practitioner, on the certificate of a coroner, and without either a medical certificate or an inquest are as shown in the table. With regard to the last part of the question, registrars of births and deaths have been required since March 2nd, 1914, to report all cases of uncertified deaths to a coroner, but complete information as to the number reported in the previous years is not available.

—	Registered on certificate of registered practitioner.	Registered on coroner's certificate after inquest.	Uncertified deaths on which no inquest was held.
1911 ..	483,944	37,200	6,666
1912 ..	443,938	36,668	6,333
1913 ..	462,396	36,419	6,160
1914 ..	472,768	37,695	6,279
1915 ..	515,441	39,128	7,684
1916 ..	463,929	36,760	7,528
1917 ..	456,666	34,704	7,552
1918 ..	570,605	33,012	8,244
1919 ..	466,017	31,488	6,698
1920 ..	429,426	30,995	5,709

WEDNESDAY, JULY 20TH.

Optical Glass and Medical Research.

The House went into Committee on the Safeguarding of Industries Bill, Mr. J. HOPE in the chair. The Committee stage of the Bill was completed.

Public Representation and Hospital Grants.

Mr. BRIANT asked the Minister of Health if grants out of public funds were made to hospitals if provision would be made for representatives of the public on the governing bodies.—Sir A. MOND replied: I will bring my hon. friend's suggestion to the notice of the Hospitals Commission, but I am disposed to doubt whether a non-recurrent grant would justify requiring hospitals to make a permanent change of this kind in the constitution of their governing bodies.

Effect of Summer Time on Children.

Sir ROBERT THOMAS asked the President of the Board of Education whether he had requested the educational authorities to ascertain the views of head teachers, school medical officers, and others on the effect of summer time on the children; if so, whether he had yet received this information; and whether such information would be published before the Summer Time Bill now before Parliament became law.—Mr. FISHER replied: I will send the hon. baronet a copy of a Circular (No. 1215) which was addressed by the Board to local education authorities in England and Wales in May last. The answers to the Circular have not yet been received.—Colonel FREMANTLE: Will any such information be balanced by the opinion of medical officers of health on adults; will the one view be balanced against the other?—Colonel ASHLEY: May we have the information before the Summer Time Bill comes up again for discussion?—Mr. FISHER: If possible.

Dangers of Lead Paints.

Captain BOWYER asked the Secretary for the Colonies whether he was aware that the International Labour Conference, sitting at Geneva in October next, would have before it a proposal for the prohibition of the use of white lead in painting; that this proposal was viewed with alarm by the Government of the Commonwealth of Australia because such a prohibition would cause the closing down of the Broken Hill lead mines of New South Wales, which were of primary importance to Australia; that such a prohibition would have a similar effect upon the lead mines of Burma and Rhodesia; and whether he would cause instructions to be given to the representatives of His Majesty's Government at the International Labour Conference to ensure that careful consideration might be given to the possibility of dealing effectively by precautionary regulations with such dangers of poisoning as were incidental to the use of paint rather than by a method which would have such serious consequences for imperial interests.—Mr. CHURCHILL replied: The answer to the first part of the question is in the affirmative. As to the second part, I have received no representations as regards Rhodesia. The Commonwealth of Australia and India are both original members of the International Labour organisation under Article 387 of the Treaty of Versailles, and provision is made for their direct representation at International Labour Conferences under Article 389. As to the third part, I understand that the instruction to be given to the representatives of His Majesty's Government will be settled later.

Medical Board Appeals in Durham.

Mr. HEYWARD asked the Minister of Pensions whether in the Easington district, county Durham, appeals against decisions of the medical board were heard before another tribunal having the same chairman as the medical board whose decisions were being appealed against; if this was so, whether he was aware that thereby a sense of grievance and injustice was caused in the minds of appellants; and whether he will give the necessary instructions to ensure

that in future no member of a medical board whose decision was being appealed against should sit on the appeal tribunal.—Mr. MACPHERSON replied: The personnel of a medical appeal board should be entirely different from that of the board whose assessment is challenged. I am having inquiries made into the position in the area mentioned, and will communicate the result to my hon. friend.

Unemployment and Health Insurance Payments.

Mr. JESSON asked the Minister of Health if any consideration was given to insured persons under the Health Insurance Act, who, being out of employment through no fault of their own, were unable to continue their contributions, and were consequently greatly in arrears: and whether it was possible for them to be kept in benefit by deducting a small percentage from their sick pay, when it was allowable, until such arrears were paid up.—Sir A. MOND replied: Insured persons who have fallen into arrears through unemployment are given an opportunity of making a comparatively small payment in order to avoid any reduction or suspension of benefits. In view of the great amount of unemployment during the past 12 months, time during which such payment may be made has been extended to Nov. 30th next, and Approved Societies have been empowered to make a special concession in the case of members who have been unemployed for more than 26 weeks in the year. Any method such as that suggested by the hon. Member which involved the collection of the arrears only from members who fell ill would not be fair to the Approved Societies, as they would not be adequately recouped for the loss sustained by them in unpaid contributions.

THURSDAY, JULY 21ST.

Government's Housing Policy.

On the Report stage of a vote for the Salaries and Expenses of the Ministry of Health,

Mr. ASQUITH moved to reduce the vote by £100 in order to review the Government's policy in relation to the vital question of housing.

Mr. CLYNES urged that any other kind of building operations should have been prohibited until the pressing human needs of large masses of the population had been met.

Sir A. MOND, Minister of Health, denied that the Government was giving up the whole of the housing programme. The fact remained that the country had now a permanent burden for 60 years of £10,000,000 a year on the taxes in order to provide houses. We had incurred a commitment of over £600,000,000, an unprecedented contribution for the Exchequer to make, and the Government were trying to review the situation at a time when there were sufficient contracts and tenders approved to occupy for at least 12 or 18 months the whole building facilities of the country. He protested against being represented as indifferent or hard-hearted. Dealing with the question of slums, the right hon. gentleman said possibly it might have been better if they had begun at that end rather than undertaking so much new construction.

Dr. ADDISON defended his housing policy at the Ministry of Health, and urged that that policy was not his alone, but was that of the Government, of the House, and even of the country. He claimed that private enterprise would not meet the need, and the Government had no right to cut down expenditure on the removal of slums while they were spending £900,000 a month on Assyrian refugees.

Mr. LLOYD GEORGE said no country in the world had made such sacrifices as this country since the war. We had found more money for housing the working classes than the United States or any other country. Let Britain get credit for what she had done. They were only crying a halt; there would not be a single house the less built. The policy of the Government was not to stop housing, but to put it on a better and more business-like footing.

The amendment to reduce the vote was rejected by 254 votes to 67, and the vote was then agreed to.

Medical Research Awards.

Mr. BRIANT asked the Prime Minister whether, in view of the vital importance of medical research to the health of the nation, the prevention or cure of disease and the alleviation of pain, there could be provided a fund from which could be paid awards for discoveries or inventions which contributed to the general health of the community and which were placed gratuitously at the service of the public, pensions to those who had become totally or partially incapacitated in the course of research, and pensions to dependents of those who had died directly or indirectly as a result of their devotion to research.—Mr. BALFOUR (Lord President of the Council) replied: I see no ground for differentiating medical from other forms of scientific research, which may be of equal value to the community, and I doubt whether any system of pecuniary awards would in the long run be beneficial to science or medicine. The difficulty of apportioning merit for even the greatest of discoveries is often overwhelming; monetary awards would lead to jealousy instead of coöperation among research workers, and might prove to be an incentive to work for results that are sensational rather than for the advancement of scientific knowledge. The question was fully discussed at a deputation which I received on March 7th, 1920, at the Privy Council Office.—Mr. BRIANT: Does the right hon. gentleman recognise that in one branch alone, the research into the value of X rays, a great number of medical men have lost their lives, and their dependents get no recognition from the nation?—Mr. BALFOUR: I believe there were in the early days of X ray investigation very serious results to some medical men who lost their lives. Of course, their dependents are eligible for pensions. The Royal Bounty Fund is available for this purpose. Whether the Royal Bounty Fund is large enough is a question on which I am not competent to give an answer.

Unemployment and National Health.

Sir BURTON CHADWICK asked the Minister of Health whether, in view of the official report of his chief medical officer calling attention to the already apparent traces of the lowering of vitality in the health both of mothers and little children due mainly to unemployment and its effects, he was taking any special precautions to ensure assistance so far as it could be given in the coming winter to these victims of industrial unrest.—Sir A. MOND replied: I am having this matter carefully watched, and will give whatever assistance is possible within the limits of my financial resources.

FRIDAY, JULY 22ND.

New Licensing Bill.

Sir G. HEWART, Attorney General, moved the second reading of the Licensing (No. 2) Bill, which was agreed to.

Haslar Naval Hospital.

Commander BELLAIRS asked the Financial Secretary to the Admiralty the total possible number of beds in Haslar Royal Naval Hospital, and the maximum and minimum number occupied in the first six months of 1921.—Mr. AMERY replied: The total possible number of beds in Haslar Hospital is 1118. During the period Jan. 1st to June 30th, 1921, the maximum number occupied was 549 and the minimum 370.

Cosham Military Hospital.

Commander BELLAIRS asked the Secretary of State for War the total possible number of beds in Cosham Military Hospital and the maximum and minimum number occupied in the first six months of 1921; and whether he could state the distance of the hospital from the great naval hospital at Haslar.—Sir L. WORTHINGTON EVANS replied: There are 200 beds in Cosham Military Hospital; the maximum number occupied during the first six months of 1921 was 104, and the minimum number was 39 (on one day only). The approximate distance from the Naval Hospital at Haslar is 12½ miles by road and 7 miles by road and ferry.

MONDAY, JULY 25TH.

Whipps Cross Infirmary.

Mr. JOHN JONES asked the Minister of Health if he was aware that the West Ham board of guardians had offered to place shelters at Whipps Cross Infirmary for the accommodation of insured persons suffering from tuberculosis, and that these shelters were well adapted for the purpose of dealing with phthisis cases; and whether he could now give reasons why the offer of the board had been refused, in view of the great shortage of accommodation for this class of patient.—Sir A. MOND replied: A medical officer of the Ministry has now been instructed to visit this institution with a view to investigating the proposal of the guardians.

Illegitimacy Bill.

Mr. WIGNALL introduced a Bill "to extend and amend enactments relating to bastardy and to affiliation and certain other orders, and to provide for the legitimation of illegitimate persons by the marriage of their parents, and to amend the law relating to the rate of legacy duty and succession duty in the case of illegitimate persons, and otherwise to make further provision with respect to illegitimacy and illegitimate persons and their parents, &c." The Bill was read a first time.

TUESDAY, JULY 26TH.

Unemployment Benefit and Hospital Treatment.

Lieut.-Commander KENWORTHY asked the Minister of Labour whether a woman, the wife of a disabled ex-soldier, who was an insured woman and would otherwise be entitled to unemployed benefit, was not entitled to the benefit because her husband was receiving hospital treatment allowance, both living together.—Sir MONTAGUE BARLOW (Parliamentary Secretary to the Ministry of Labour) replied: A woman who is otherwise entitled to receive unemployment benefit is not disqualified by reason of the fact that her husband is a disabled ex-soldier receiving hospital treatment allowance.

Medical Diary.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith, W.

TUESDAY, August 2nd.—Opening of Vacation Course. 10 A.M., Surgical Registrar: Demonstration of Cases (Surgical Wards). 2 P.M., Dr. Burnford: Medical Out-patients. 2.30 P.M., Mr. Addison: Demonstration of Cases (Surgical Wards). 4.30 P.M., Lecture:—Dr. Pritchard: Intravenous Therapy.

WEDNESDAY.—10 A.M., Dr. A. Saunders: Medical Diseases of Children. 11 A.M., Mr. MacDonald: Demonstration of Cystoscopy. 12 noon, Mr. Sinclair: Surgical Diseases of the Abdomen. 2 P.M., Mr. Gibb: Eye Department. 4.30 P.M., Lecture:—Mr. Addison: Carcinoma of the Breast.

THURSDAY.—11.30 A.M., Obstetrical Registrar: Gynæcological Demonstration. 2 P.M., Dr. S. Pinchin: Medical Out-patients. Mr. MacDonald: Surgical Out-patients. 4.30 P.M., Lecture:—Dr. A. Saunders: Rickets.

FRIDAY.—10 A.M., Mr. D. Buxton: Dental Department. 12.15 P.M., Dr. Burnford: Applied Pathology. 2.30 P.M., Dr. Pritchard: Visit to Mecical Wards. 4.30 P.M., Clinical Lecture:—Mr. Banks Davis: Throat, Nose, and Ear.

SATURDAY.—10 A.M., Medical Registrar: Demonstration of Cases (Medical Wards). 2 P.M., Mr. Sinclair: Surgical Out-patients.

Daily:—10 A.M., Visit of Post-Graduates to Wards. 2 P.M., In-patient, Out-patient Clinics and Operations.

Appointments.

BELLWOOD, K., F.R.C.S. Eng., has been appointed Surgeon to the Albert Dock Hospital of the Seamen's Hospital Society.

HAUXWELL, FRANK, M.B., Ch.B. Glasg., D.P.H. Camb., Medical Officer of Health and School Medical Officer, County Borough of St. Helens.

MCILROY, J. HAMILTON, D.Sc., M.B., Ch.B. Glasg., Lecturer on Diseases of the Eye in the Lady Hardinge College, Delhi.

PINNOCK, D. DENHAM, M.B., B.S. Melb., F.R.C.S. Eng., Assistant Surgeon to the London Temperance Hospital.

SLOT, GERALD M., M.D. Lond., Medical Registrar to Charing Cross Hospital.

Vacancies.

For further information refer to the advertisement columns.

Aberdeen Royal Infirmary.—Jun. M.O. £500.

Bedford County Hospital.—H.S. £200. Asst. H.S. £150.

Bethlem Hospital.—Res. H.P. £25 per quarter.

Birkenhead Borough Hospital.—Jun. H.S. £200.

Birmingham General Hospital.—Res. M.O. £155.

Birmingham, Queen's Hospital.—Surg. Registrar. £100.

Bradford Royal Eye and Ear Hospital.—Hon. Asst. Ophth. Surg.

Bradford Royal Infirmary.—H.S. £200.

Carlisle Non-Provident Dispensary.—Res. M.O. £300.

Devonport, Royal Albert Hospital.—H.S. £200.

Downpatrick, Down District Asylum.—Sen. and Jun. Asst. M.O.'s. £350 and £300 respectively.

East Suffolk County Education Committee.—Female Asst. Sch. M.O. £500.

Evelina Hospital for Children, Southwark, S.E.—H.P., H.S. Each £160.

Freemasons Hospital and Nursing Home, 237, Fulham-road, S.W.—Res. M.O. £250.

Glasgow, Woodilee Mental Hospital, Lenzie.—Asst. M.O. £350.

Gloucester County Asylum.—Jun. Asst. M.O. £350.

Great Northern Central Hospital, Holloway, N.—Dental Surg.

Halifax Royal Infirmary.—Second H.S. £250. Third H.S. £200.

Hull Royal Infirmary.—V.D. and Cas. O. £250. Asst. H.S. £150.

Jersey Poor House Infirmary.—M.O. £750.

Kent County Council, Lenham Sanatorium.—Asst. M.O. £400.

Leeds Public Dispensary.—Sen. Res. M.O. £250.

Leicester Royal Infirmary.—H.P. £200.

London University.—University Readership in Pathological Chemistry. £700.

Loughborough and District General Hospital and Dispensary.—Res. H.S. £200.

Manchester, Ancoats Hospital.—H.S. £150.

Manchester Hospital for Consumption and Diseases of the Throat and Chest.—Res. M.O. £350.

Middleton-in-Wharfedale Sanatorium.—Asst. M.O. £500.

Miller General Hospital for South-East London, Greenwich-road, S.E.—Res. Cas. O. £200.

Newport (Mon.) Royal Gwent Hospital.—H.S. £200.

Nottingham City Asylum.—Med. Supt. £700.

Oxford, Radcliffe Infirmary and County Hospital.—Cas. H.S. £200.

Plymouth, South Devon and East Cornwall Hospital.—H.P. £150.

Preston County Asylum, Whittingham.—Asst. M.O. £572 18s.

Queen Mary's Hospital for the East End, Stratford, E.—Cas. O. £150.

Royal Dental Hospital of London, Leicester-square, W.C.—Whole-time Officer. £800.

Royal Naval Medical Service.—Surg.-Lieuts. 26s. 6d. per diem.

Seamen's Hospital Society, Greenwich, S.E.—H.P. H.S. Each £150.

Singapore Municipality.—Bacteriologist. 9000 dollars.

Stockport General Infirmary.—Sen. Res. M.O. £300.

Swansea County Borough.—Asst. M.O. £500.

Torquay, Torbay Hospital.—H.S. £200.

Union of South Africa (Natal Provincial Administration).—House Surgeons, Grey's Hospital, Pietermaritsburg. £400.

Victoria Hospital for Children, Tite-street, Chelsea, S.W.—Cas. Sorting Officer and Anæsthetist. £100.

West End Hospital for Nervous Diseases, 73, Welbeck-street, W.—Clin. Asst.

Westminster Hospital, Broad Sanctuary, S.W.—H.P.

Wigan County Borough.—Tuberculosis Officer and Asst. M.O.H. £550.

Winsley Sanatorium, near Bath.—Asst. Res. M.O. £250.

Worcester County and City Mental Hospital, Powick.—Jun. Asst. M.O. £350.

THE Chief Inspector of Factories, Home Office, S.W., gives notice of the following vacant appointment: Tisbury (Wilts).

Births, Marriages, and Deaths.

BIRTHS.

FINNY.—On July 22nd, at "Tamesa," Kingston-hill, Surrey, the wife of William Evelyn St. Lawrence Finny, M.D., J.P., Barrister-at-Law, Mayor of Kingston-upon-Thames, of a daughter.

GOOD.—On July 13th, at Moorland-road, Leeds, the wife of John Good, M.R.C.S., L.R.C.P., of a daughter.

HOFFMAN.—On July 15th, the wife of H. Drummond Hoffman, M.B., B.Sc. Camb., Tatsfield, Surrey, of a son.

HORSBURGH.—On July 12th, at Eastmount, Dover-street, Ryde, the wife of E. Leslie Horsburgh, M.D., of a son.

OVEREND.—On July 17th, at Lynton Lodge, Cadishead, Lancs., to the wife of H. F. Overend, M.R.C.S., L.R.C.P.—a daughter.

PURSER.—On July 22nd, at Inkerman Barracks, Woking, the wife of Lieut.-Colonel L. M Purser, D.S.O., R.A.M.C., of a son.

SELBY.—On July 20th, at S. Ealing-road, W., the wife of E. J. Selby, M.R.C.S., L.R.C.P., of a son.

SLADDEN.—On July 24th, at Cheltenham House, Eaton Grove, Swansea, to Dr. and Mrs. Arthur Sladden—a son (Robert Arthur).

STEPHENS.—On July 19th, at Crouch-hill, the wife of Capt. H. F. Stephens, R.A.M.C., of a son.

WAKEFORD.—On July 23rd, at Fulham-road, S.W., the wife of V. D. C. Wakeford, M.B., B.S., of a son.

MARRIAGES.

CLARKE—BLAKE.—On July 23rd, at St. Marylebone Parish Church, James Kilian Clarke, M.B., Ch.B., D.P.H., Lecturer in Pathology and Bacteriology at the School of Medicine, Cairo, to Evelyn Muriel, daughter of Mr. and Mrs. A. H. Blake, of Brondesbury, N.W.

DEATHS.

DOWNIE.—On July 21st, at Cragmohr, Shandon, James Walker Downie, M.B., C.M., F.R.F.P.S. Glasg.

REYNOLDS RAY.—On July 8th, at 4, Coventry House Chambers, Haymarket, after a long illness, Edward Reynolds Ray, M.R.C.S. Eng., L.S.A., formerly of Dulwich Village, S.E., aged 79.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

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INDUSTRIAL HYGIENE: ITS RISE, PROGRESS, AND OPPORTUNITIES.[1]

BY SIR THOMAS OLIVER, M.D. GLASG., F.R.C.P.

IT is just over a century ago since the British Parliament turned its attention to the fate of children employed in the mines and factories of this country, and little more than half a century ago since diseases due to occupation received similar recognition. Great Britain was the pioneer of industrial legislation. The utilisation of water power and steam led to the rise of the factory system and to the growth of large towns. The "Industrial Revolution," which began about 1740, and the inventions which preceded and followed it, not only placed us as a nation in a high position in the world of commerce and made us wealthy, but it created new methods of employment associated with the subdivision of labour, as well as a new class of workers to meet the requirements. It also initiated problems towards the solution of which, as the statesmen of the time had no experience to guide them, the laws which they framed could at the best be but only tentative and a makeshift. While the introduction of machinery made labour in the factories in one sense less irksome, it led to the employment of women and children, many of whom, owing to the long hours and low wages, rapidly broke down in health, with no financial assistance from the State or from the industry to fall back upon, so that to ill-health were added the distressing circumstances of poverty and starvation with only the workhouse to look forward to. In order to prevent physical degeneration of the working classes it became necessary to improve the conditions under which labour was carried on in mine and factory by shortening the hours of labour for women and children, and by raising the age of child workers. The employment of children of seven years of age in our coal-mines and factories, and the harsh treatment extended by overseers to them, since they were frequently beaten or handled roughly when they were found asleep at work, form unpleasant reading in the pages of the industrial legislation of this country.

Industrial Legislation.

From the first decade of last century onwards to the Victorian period Parliament time and again shortened the hours of labour, restricted the employment of children, and improved conditions within the factories, but even as late as 60 years ago little had been done to instil into the mind of the people the association of certain diseases with particular occupations, and how these diseases might be prevented. Thackrah, in 1831, had written upon the subject, and J. T. Arlidge, in 1892, had published his monumental work, but occupational diseases as a class had not yet caught on with the medical profession, and so matters drifted. Sir John Simon, at the dawn of the public health movement in this country, recognised how closely identical was the health of workers with the object sought to be secured by a public health service, and that in the prevention of disease lay one of the most important duties of the medical profession. To-day the preventive side of industrial medicine is regarded as even more important than the curative. Industrial hygiene may be said to have merged out of, or to have been a continuation of, Parliamentary interference with the claims of employers to utilise labour almost to its breaking point. Occupation was never meant to cripple workmen, cause ill-health, or induce early death. It was thus that medicine was drawn into the social movement in which it plays an honoured part to-day. In few fields of human activity has the call for preventive medicine been greater than the various industries of this country, with their former high mortality and sickness rates. Society, in the past, kept itself too far aloof from knowledge of the conditions under which certain trades were carried on, and even the workers themselves were not always aware of the dangers to which their employment exposed them. Ignorance is responsible for many of the calamities which overtake us. It became necessary to instruct workers and employers in regard to occupation and health, for to have knowledge is to be forearmed. Regulations drawn up by the Home Office, and meant for the welfare of workers, have from time to time been challenged by both employers and employed, and there is no objection to this, since at a conference of the parties concerned conflicting opinions may be modified, or, failing this, a compromise is effected, and work allowed to continue, during which fresh regulations can be given a trial.

The Widened Scope of Industrial Hygiene.

Within the last few years the scope of industrial hygiene has widened. It includes not only consideration of the conditions under which work is carried on, the hours of labour and diseases incidental to occupation, but it deals with the physical effects of work as seen in fatigue and how hours of work and rest may be correlated so that there may be obtained the maximum of production with the minimum of effort, also that the hours of respite from labour may be made sufficiently long for recovery from exhaustion to take place. The tendency has been to remove from labour any serfage element which may have clung to it as a remnant of bygone days, and to recognise that men and women are not mere machines, but that they are entitled to the opportunities of improving themselves mentally and physically. To-day industrial hygiene is no longer the affair of one nation but of all the advanced nations. The creation of the International Labour Bureau under the ægis of the League of Nations has raised industrial medicine to a higher platform, so that while the health of the workers is one of the main objects, and production is regulated by the physical fitness of the worker and by the hygienic conditions under which labour is carried on, the fact that industrial medicine has become international will incite backward nations to aim at securing a higher standard of health for their workpeople, as well as more efficient means of increasing production. Arising out of legislation passed for improving conditions of labour and shortening of the hours of work, and proceeding through medical supervision of workers and the elimination of the unfit as well as the substitution of comparatively harmless for harmful methods of production, of industrial medicine it may be said that although it has made such rapid strides that many of the results obtained have become fresh energising influences in the life of nations, yet many opportunities for good still lie in front of it.

Medical examination of workers before commencing their industrial career would no doubt create hardships, but the ultimate gain would transcend all these. Even with the ordinary precautions taken there would still be found a certain number of persons who would break down in health earlier than others, either as the result of diminished vital resistance or of idiosyncrasy.

Sir Thomas Oliver then gave an account of the transformation from dangerous into comparatively safe industries those of lead-mining and match-making, and discussed briefly the pathology and prevention of carbon-monoxide poisoning, adding a short survey of the preventable hazards to which coal-miners were formerly subjected. He continued:—

Fatigue.

There is one side issue of industrial hygiene which has recently attracted attention—the subject of fatigue. A hundred years ago the world moved, as the saying is, more slowly than it does to-day. Men took things more quietly; there was neither the strain nor the competition characteristic of modern times. Hard work was followed by fatigue then as now, but it affected principally the muscular system: to-day it falls more upon the nervous system. Collective work is carried on in over-heated factories amid the din of machinery and it demands close attention. The reality of fatigue was brought home to us by the large number of men and women who broke down in munition work during and after the war. There is a limit beyond which the human machine cannot produce satisfactorily. Fatigue as subjectively experienced is a series of ill-defined sensations not always localisable, attended by disinclination for work and by a desire to rest. Professor Drever [2] thinks that the word "weariness" pretty accurately describes the subjective state in the individual, and that objectively fatigue can best be defined in terms of output, as shown by a lowered efficiency in the organism, and revealed by impairment of the quality, and diminution of the quantity, of work done. The delicate nerve cells and nerve endings of the human body become readily fatigued, but if we take fatigue to mean an inability to carry on as previously, then fatigue is not confined to living tissue alone, for a similar event occurs in the inorganic world. Steel wires when over-strained play out and behave as tired nerves. It would be of the greatest assistance if we could with a certain degree of definiteness ascertain just to what number of hours a man can work before his energy begins to fail, for once this takes place, if work is continued, it is unprofitable. Clearly the number of hours of work cannot be the same for all individuals or for all trades. As regards fatigue, much will depend upon the previous health and upbringing of the worker, how he is fed and housed, and how he spends his leisure hours.

The recent war has been followed by disastrous consequences in the case of many of the discharged soldiers.

[1] Abridged from a Special Address delivered at the Eighty-Ninth Annual Meeting of the British Medical Association.

[2] Drever: The Psychology of Industry, p. 61. Methuen.

The long weary vigil in the first line of trenches and the hardships endured, also the comparatively idle months spent away from the firing-line, have made many of the men unwilling or unable physically to return to their previous employment. Some of them have lost their taste for work, and they clamour, like those who remained at home, for shorter hours of labour. Shortening of the shifts and a change in the hours of work are notable facts of the times. Men no longer go fasting to work at 6 o'clock in the morning and breakfast in the factory at 8 o'clock. They leave home, or ought to, after a comfortable breakfast in time to reach the factory by 7.30 A.M., and this has been to the advantage of employer and employed. Better time-keeping has been the result and there has been less sickness. Shortening of the hours has, in most industries, been followed not by diminished but by increased production and by a rise in wages, but as there is a limit to which hours can be shortened and productive efficiency retained, it is a question whether, in some trades, this limit has not now been reached. It is unwise to work men and women to the last unit of their energy, for not only is work under these circumstances never so good, but fatigue—although the contention is not supported by Dr. Vernon—may become a cause of accident. It is now generally admitted that fatigue is the result of the action upon the tissues of such poisonous substances as carbon dioxide and lactic acid formed by the chemical dissolution of the glycogen of overworked muscles. These bodies act, not only upon the muscular tissue itself and the nerve endings in the muscles, but since they find their way into the blood stream they poison the higher nerve centres in the brain, thus converting fatigue, the outcome primarily of localised changes in the neuro-muscular apparatus, into a general state of the organism, and of these two forms of fatigue, central and local, the central or general fatigue is the more important.

Sir Thomas Oliver then alluded briefly to the effect of fatigue on the blood, demonstrated by Dr. Otto Burkard, of Graz, and after commenting on the problems arising out of compensation for industrial disease, concluded with a few words on

The Industrial Medicine of the Future.

Since industrial medicine has come to stay, facilities will in the future have to be provided to medical students and young graduates to become familiar in a practical manner with its objects. Never were the times more opportune than to-day. The prosperity of a nation is intimately bound up with the health of the people who compose it. Preventive medicine has, practically speaking, swept these islands clear of typhoid fever and considerably reduced the mortality of diphtheria. What it has accomplished on the side of public health it can also accomplish in regard to occupational disease. The die has been cast. There is a psychology of industry just as there is a physiology. Psychology is no longer simply "the science of mind or soul," but "the science of the facts of human nature and behaviour," and there is no department of human activity which offers greater scope for its study and application than industry. Employers no longer regard "industrial hygiene" as something to be turned down on the ground of its interference with labour and the conditions under which it is carried on. They recognise that it introduces into industry just that something with a touch of humanity in it which softens the asperities of labour, makes occupation more healthful, and tends to bring employers and employed into closer touch with each other. Had it not been for "welfare work" carried on during the years 1914 to 1918 the enormous productions of munitions could hardly have taken place, and without it we would have lost the war. Industrial medicine and welfare work go hand in hand. Invention and chemical research tend to make industrial processes, if not more complicated, sometimes more dangerous, as was the case in the early days of the war with the handling of certain high explosives, but the same inventive skill which created temporary dangers showed itself equal to supplying an antidote to them or of finding a substitute. In the ever-enlarging sphere of industrial enterprise, to which the various sciences are contributing, and the needs of the world are calling for, lies the opportunity of Industrial Hygiene.

A MINE MEDICAL OFFICERS' ASSOCIATION ON THE RAND.

MEDICAL service to white workers in most of the gold mines on the Rand is secured by the appointment of one, two, or more whole-time or part-time medical officers by a Mine Benefit Society, to which each worker contributes, and the funds of which are administered by a committee elected by the men themselves. Recreation rooms, library, billiard rooms and facilities for outdoor games are also provided by the Benefit Society, and a hospital is run for the employees of one mine alone or for those of two or three neighbouring mines. The native employees as a rule are under the care of doctors appointed by the proprietors of the mine, and besides staffing the native hospitals these doctors are responsible for supervising the sanitation of the compounds and the hygienic conditions of the native worker. In order to stimulate discussion on the important problems involved in the care of the native, a Mine Medical Officers' Association has recently been formed, its objects being: (1) To study and discuss all problems of special interest appertaining to the work of mine medical officers. (2) To promote and foster friendly intercourse and consequent exchange of views among mine medical officers. (3) To bring to the attention of members matters of interest to them in their special work, by means of periodical publications, &c., as may from time to time seem most advisable. (4) To coöperate in solving administrative and other problems confronting members. Those eligible for membership are medical officers holding whole or part-time appointments in connexion with mine native hospitals in the Transvaal, and such other medical practitioners as the Executive Committee may from time to time invite. The special liability to pneumonia of certain tribes of natives, their protection from scurvy, and the management of epidemics such as that of tropical ulcer which has recently attacked the native workers at one of the mines, are a few of the problems to which the new Association may be expected to give attention.

In the *Medical Journal of South Africa* of March and April 1921, an account of the first meeting of the new Association is given. Dr. A. J. Orenstein reviewed the theories as to the ætiology of scurvy, and spoke of its special interest to medical officers of mines dealing with native employees. In the early days of large scale mining operations scurvy, he states, was prevalent, and though in recent years it had decreased enormously, there had occurred in 1920 in one of the important groups of mines over half the number of cases recorded in that group during the last six years. The figures he gave were as follows:—

—	Cases.	Repatriated.	Deaths.
1915	69	51	2
1916	116	55	1
1917	52	56	2
1918	51	69	3
1919	106	38	5
1920	403	102	16
Total ..	797	371	29

Dr. Orenstein said that the vitamin theory was substantiated by the experiences of medical officers in the Rand. In every instance which had come under his own observation in the last six years an outbreak of scurvy was associated with a diminution of the vegetable ration, or gross overcooking of the same, and in every instance an increase in the vegetable ration, or an improvement in the cooking of same, resulted in the prompt checking of the outbreak. Dr. Marion Delf was continuing work started at the Lister Institute on the effect of cooking on the anti-scorbutic vitamin at the South African Institute for Medical Research.

At the same meeting Dr. S. Donaldson read a paper on the Clinical Side of Scurvy in the Mine Native Labourers; he described two types of case, one of which was much more amenable to treatment by anti-scorbutic remedies than the other. In the course of the discussion Dr. Orenstein expressed his conviction that the condition found in mine natives was not scurvy alone, but was due to a deficiency in all three vitamins. Certain cases had improved rapidly after receiving vitamin B., and others after fat soluble A. had been increased in their diet.

FACTORY GIRLS' COUNTRY HOLIDAY FUND.

To the Editor of THE LANCET.

SIR,—Will you allow us to make a very urgent appeal for funds to send working girls and women away for a short holiday? Many of those who are hoping to go during the next few weeks have never slept out of London for a single night. We are almost at the end of our resources, and the need for our help is probably more urgent than ever before. Trade depression has resulted in the girls being the main support of thousands of families, which but for their earnings would be on the verge of starvation. The general standard of comfort in the average home is lower than it has been for many years, and the health of the community in the crowded and airless factory districts of London has deteriorated considerably. Nor has it been possible for the girls to save for a holiday as they have done in former years. Good food, rest, and fresh air for a short time will make it possible for many to continue their work through the winter, who would otherwise break down under the strain and privation they have had to bear for so many months, and the short holiday will give them fresh hope and courage. We earnestly ask for subscriptions and donations to be sent to the Chairman of the Executive Committee, Mr. J. F.

Green, M.P. 75, Lamb's Conduit-street, W.C.1, or to the London County Westminster and Parr's Bank, Hatton Garden, E.C. 1. We are, Sir, yours faithfully,

JOHN KENSINGTON, ALBERTA SANDWICH, LOUISE CREIGHTON, MARY ST. HELIER, J. H. HERTZ (Chief Rabbi), ROBERT F. HORTON, FRANK LLOYD, J. F. GREEN (Chairman).

July 19th, 1921.

TRIFOLIUM STELLATUM AT SHOREHAM.

To the Editor of THE LANCET.

SIR,—In the obituary notice of the late Sir George Savage, appearing in your issue of July 16th, a personal friend mentions an unsuccessful search for the star clover at Shoreham, and adds that it is still there. I should be glad to hear if this is really so. Over 30 years ago I can remember Mr. G. C. Druce showing me a pocket-case full of the stellate fruits he had gathered on the beach. During the decade 1902–11 I searched every year for the plant, but only found it (and then very sparingly) on two or three occasions. The erection of bungalows, formation of roads, and other human activities resulted in its practical extinction, so far as my limited observation went. As Shoreham beach is the only British habitat for a rather striking plant, I should be very glad indeed to hear that it was still holding its own. Perhaps some of your South Coast readers have some recent information on the point? I may add that from seeds obtained at Shoreham I have grown specimens of the plant in my garden for many years past.

I am, Sir, yours faithfully, J. E. SAUL.

Analytical and Bacteriological Department, Savory and Moore, Ltd., 143, New Bond-street, London, W., July 19th, 1921.

PUBLIC HEALTH AT COLOMBO, 1919.

IN his report on the conditions of public health at Colombo during 1919, Dr. W. Marshall Philip, the medical officer of health, commences by stating that the birth-rate, 21·7 per 1000, was the lowest recorded for 15 years, whilst the death-rate, after falling from 39·8 in 1906 to 24·3 in 1917, had risen to 28·0 in 1918 and 28·8 in 1919; the infant mortality, having fallen from 419 per 1000 births in 1903 to 234 in 1916, had risen to 251, 266, and 271 per 1000 in the three years 1917–1919 respectively. The population is estimated to have been 271,616 in the middle of 1919, but the correctness of this is open to doubt, especially in certain wards, where a large number of new buildings have been erected. Among the various races included in this total, the native Sinhalese naturally form the majority (121,848), after whom come Tamils from Southern India (65,797), Moors (47,854), Burghers (Dutch or Portuguese, 17,812), and Europeans (3795), the remainder consisting of Malays and others. The birth-rate varied from 12·1 amongst Tamils to 32·0 amongst Malays; for Europeans it was 17·1, for Moors 17·6, and for Sinhalese 27·9. The general crude death-rate of 28·8 is to be compared with the decennial average (1909–18) of 28·2; if corrected for deaths in hospital of non-residents, and for age and sex constitution, the ratio becomes 29·7, "which is the nearest approach to the true death-rate of Colombo which can at present be obtained." The corresponding ratio for 1918 was 29·4 per 1000. As regards the different races making up the total (crude) ratio of 28·8, for Sinhalese the ratio was 34·3, for Moors 24·2, for Tamils 23·1, and for Europeans 17·1 per 1000; if corrected for deaths in institutions, this last figure becomes 9·8, practically the same as in 1918, when it was 9·5 per 1000. The infantile mortality ratio (271 per 1000 births) was higher than in any year since 1913, when it had been 286. Dr. Philip discusses this matter and "is forced to the conclusion that one of the principal causes, if not the chief cause, is lack of proper nourishment for the pregnant women and their infants," probably owing to increased cost of living since the war broke out. Owing to failure of the monsoon in 1918, the Indian Government restricted the export of rice. The normal monthly import into Ceylon of 30,000 tons fell to less than half in May, and less than a quarter in June; food control was initiated on May 9th, and rationing of rice on June 10th. The cost of living has been increased in Ceylon, as elsewhere, but Dr. Philip clearly shows that there was no "starvation," though there was a good deal of "privation" and anxiety. The daily crowding together of the people entailed by the introduction of the rice depôt system was apparently responsible for an increase in enteric fever and measles; and the storage of grain in buildings not rat-proof resulted in a number of cases of plague in the last three months of the year. The proportion of septicæmic cases (57·4 per cent.), and the very high case-mortality (94·3 per cent.) showed that there had been no material reduction in virulence. No cases of cholera occurred in Colombo, but ten were admitted to hospital from the port, and one from outside the town. There were only three cases of small-pox, two having acquired infection in India. Primary vaccination was performed in 6637 children, the number of births in Colombo during the year having been 5907. This is very satisfactory, and should be an example to that unfortunately large number of persons in the United Kingdom, who are either unable or unwilling to realise their responsibilities in regard to this matter. Dr. Philip's is a most comprehensive report, fully illustrated with plans and diagrams, and contains much other matter of interest.

ACTION OF THE HEART AFTER DEATH.

SOME interest has been evinced in our correspondence columns by Sir Dyce Duckworth (July 2nd), Sir William Milligan (July 9th), and Surgeon Commander D. H. C. Given (July 23rd) in the circumstances of the death of a man at Willesden whose heart continued beating long after respiration had ceased. At the inquest on June 20th a verdict of "Death from natural causes" was given, the circumstances of the case being as follows. The man became drowsy about Whitsuntide with severe pains in the head, but continued to work until a fortnight before his death, when he became worse. On admission to the hospital he was suffering from drowsiness, stiffness of the muscles of the back, and headache. It was considered advisable to obtain a sample of his cerebro-spinal fluid, and to this end he was anæthetised with a mixture of ether and chloroform at 11.20 A.M. on June 16th. Some fluid was drawn off—the whole operation took only half a minute, but the man ceased to breathe, though his heart continued to beat well. Artificial respiration was continued up to 7.30 P.M., when the heart ceased beating. The post mortem revealed a tumour on the right side of the brain, which proved to be a sarcoma. A tracing of the heart was taken at 5.30 P.M.

As is well known, in chloroform anæsthesia the respiratory movements may suddenly cease, and after a time be resumed. The heart beats, however, unlike the respiratory movements, do not essentially depend on the integrity of a nerve centre in the medulla oblongata. In fact the heart contains in its own walls and perhaps in its own muscular fibres the secret of its own rhythm. The fact that an excised heart in some animals will beat for days proves this. Those who are not acquainted with the marvellous powers of endurance of the heart muscle regard the heart itself as a singularly vulnerable organ. The very opposite is the case, and it will go on beating for quite a long time, even under seemingly very unfavourable conditions. Its demands are small but specific. In the present case artificial respiration, it appears, was kept up for about seven hours, the heart only ceasing to beat at the close. With the artificial movements of the chest wall the blood would be aerated to a certain extent, and as the heart still retained its automatic rhythmical movements, this partly aerated blood was sufficient to maintain the heart beat, but would not appear to have had the properties necessary for the excitation of the respiratory centre on the one hand, and the maintenance of consciousness on the other. We know how sensitive cerebral tissue is to the lack of oxygen and other conditions.

Prof. C. Richet some years ago obtained a film of the beating of a dog's heart with the chest opened, artificial respiration being kept up or arrested at the will of the operator. With cessation of the artificial respiratory movements, after a time the heart—engorged with blood—ceased to beat. On resumption of the artificial respiration, after a time the congested condition of the heart was relieved, and it slowly but surely resumed its beat. This could be done time after time. In the case recorded above the steady artificial maintenance of the respiratory movements, no doubt, kept the blood sufficiently aerated to ensure the long-continued beating of the heart. At what hour did "death" in the eye of the law take place? With the cessation of normal unaided respiration and loss of consciousness, while the heart still continued to beat; or only when normal respiratory movements and consciousness had long ceased; or when the heart itself ceased to beat?

The law presumably would regard the question as one of fact, depending upon the evidence of the medical witnesses. It would probably ask that the time should be fixed when all symptoms of life ceased, and suggest that this should be treated as the time of "death." It would be difficult to maintain otherwise. In the above case artificial respiration was kept up in the not unreasonable hope that natural respiration and consciousness might eventually be restored, and a medical witness could hardly say that a person was beyond doubt "dead" at a time when he himself, guided by the experience of his profession in other cases and by the observed action of the heart, was treating him as though he were, or might be alive. The question of the exact moment at which life ceases is not often of importance, but it may affect the devolution of property. In the case of the subject of the inquest referred to, if someone had died at 1 P.M. on June 16th leaving to him a sum of money or land in fee simple, the hour of his death might become of extreme interest to his children and to others affected by the same will.